Accelerate Learning STEMscopes Biology Texas

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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.

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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 some implementation guidance to meet variability in program design and scheduling.

Section 9. Design Features

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

Section 10. Additional Information

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

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Indicator 2.1

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 engage in problem-solving to develop an understanding of science concepts.	M

Meets| Score 4/4

The materials meet the criteria for this indicator. Materials are designed to strategically and systematically integrate scientific and engineering practices and course-level content 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 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 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 opportunities for students to develop, practice, and demonstrate mastery of appropriate scientific and engineering practices (SEPs) outlined in the TEKS. For example, each scope contains a "Science Connection" and an "Engineering Connection" section where students continue developing, practicing skills, and demonstrating mastery of the content. In the "Evidence for Evolution" scope, under the Elaborate section, students will see a Science Connection where they compose a speech about "Evolutionary Relationships among a group of Species." This activity aligns with SEP.3.a and 3.B, requiring students to gather and compile evidence to support their speech. Another example is in the "Evidence for Evolution" scope, under the Elaborate section within Engineering Connection. In this section, students use the steps of the Engineering Design Process to design food for a reptile that will allow it to be as fast as possible on land and water. These two examples of implementing the Science and Engineering Practice help provide students with practice for mastery. Furthermore, in the "Homeostasis" scope, students are allowed to develop, practice, and demonstrate mastery of appropriate scientific practices in the form of phenomenon analysis questions, modeling the process of cell transport, multiple writing opportunities, and a gamelike assessment called

"Pulse Check". Pulse Check is an activity in which they "create a commercial to inform the community about the structure and function of the cell membrane." These scientific practices demonstrate the students' understanding of of the cell membrane drives the process of homeostasis in cells.

- The materials provide opportunities for students to develop mastery of the science and engineering practices, as outlined in TEKS 1A. TEKS 1A states students should "ask questions and define problems based on observations or information from text, phenomena, models, or investigations." Guidance is provided for teachers to "Have students write their outstanding questions and unclear thoughts on sticky notes. Students can post their sticky notes in a designated spot in the classroom. This area is called the Muddy Waters because it is where questions (or unclear ideas) can be found. You can extend your use of Muddy Waters by doing the following: As the lesson progresses, students can remove their questions from the Muddy Waters as the answers become clear. Once the lesson is over, the class can review the remaining questions in the Muddy Waters and define problems, discuss possible solutions or identify additional options for the investigation to answer the questions."
- Furthermore, the materials provide Engineering Connections, where the problem is already defined for the students. For example, the context of the problem is given in the "Meiosis and Reproduction" scope. Still, instead of students defining the problem independently, they are challenged to design "a model that provides a solution to one of the disruptions in meiosis and demonstrates how the correction increases the genetic diversity of the organism's population."

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 content and grade level or course outlined in the TEKS. For example, in the "Cell Cycle and Specialization" scope, the Teacher Resources suggest a Spiral Opportunity, which reviews the "uses of the organelles in cell division… when students study the organelles that are present in different types of cells." This concept was previously introduced in the earlier scope, "Prokaryotic and Eukaryotic Cells." Also, the materials provide a progress monitoring system that supports the development of students' content knowledge and skills as outlined by the TEKS. Within the Engage section of each scope, there is a subsection called "Progress Monitoring and Reflection," which contains trackers for students' qualitative and quantitative data regarding each TEKS. For example, in the scope of "Gene Expression," the tracker monitors TEKS 7B and 7C, breaking them down into "I can" statements that students can easily gauge. As the TEKS outlines, this monitoring system allows the systematic development of students' content knowledge and skills as they progress through concepts throughout the grade level.
- Furthermore, each scope provides a systematic progression of student development by utilizing the 5Es. The 5Es offer a sequential pattern that takes the student through the content by introducing a phenomenon: Exploration, Elaboration, and Evaluating. Each part of the 5Es strategically expounds on the previous material. For example, in the "Results of Evolution" scope, the Engage section provides students a pretest to gauge knowledge growth and development before continuing to the next area of student learning.

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Materials include sufficient opportunities, as outlined in the TEKS, for students to ask questions and plan and conduct classroom, laboratory, and field investigations, and 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. For example, in the scope, “Ecological Relationships,” under the Elaborate section, in Engineering Connection, students design a filtering system for microplastics in freshwater. The student uses the Engineering Design Process (EDP) as a guide to define the problem, brainstorm, plan, build, test, redesign, and share. Following the EDP, students develop questions regarding the problem. Furthermore, in the “Results of Evolution” scope, the activities are designed for students to explore and discover the knowledge in a teacher-facilitated, student-led environment via the 5E method, in which peer-to-peer interactions and cooperation drive the learning process among students.
- Investigations include sufficient opportunities for students to ask questions and plan investigations. According to SEP.1.B, students must "apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations." The opportunities for students to ask questions and plan investigations align with the TEKS. Materials provide teacher-directed laboratory investigations with sufficient opportunities to use scientific practices to plan and conduct their investigations. For example, in the Edible DNA Lab, in the Explore section, students build DNA models using various candies and toothpicks. The lab provides an opportunity for students to ask questions or plan and conduct their investigations into DNA or the models they made in an exploratory manner. Furthermore, this can be seen in the Explore Darwin’s Finches section of the “Mechanisms of Evolution” scope. This section states, "The following variation allows students to create their own question and investigation about the mechanisms of natural selection. You can utilize the ‘I Wonder…’ Investigation Template to help students plan the investigation. Remind students they are studying the mechanisms of natural selection and they have been challenged to plan and conduct an investigation that relates bird beaks and food sources to natural selection. Give students time to create a testable question that relates to the topic, teachers may choose to review these before students continue. For a guided approach, the teacher may provide a list of available materials for students to use while they plan and conduct their investigations. For a more open-ended approach allow students to determine all materials needed. Teachers may need to review and approve materials based on availability. Now, students plan an investigation including variables, safety precautions, and the procedure to test the question posed. Have students identify safety procedures before they begin investigations. Allow each group time to carry out their investigation and collect all required data. When complete, have students complete the ISNs associated with this activity."
- Furthermore, in the “Biomolecules” scope, in the Explore section, students test the function of amylase. This provides an opportunity for students to conduct an investigation and develop an understanding of the role of enzymes in cellular processes.

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Indicator 2.2

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

1	Materials embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through authentic application and performance of scientific and engineering practices 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 the scientific concepts and goals behind each phenomenon and engineering problem for the teacher.	M

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials anchor 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 the scientific concepts and goals behind each phenomenon and engineering problem for the teacher.

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 scientific and engineering practices (SEPs) and course-level content outlined in the TEKS. Each scope begins with an activity to activate prior knowledge. Then a phenomenon in video form is presented to students with an accompanying handout with probing questions about the phenomenon to connect content standards to engineering practices. The curriculum provides multiple opportunities to develop grade-level appropriate scientific and engineering practices and practice grade-appropriate scientific and engineering practices with opportunities to repeat the practices throughout the course. For example, in the "Carbon and Nitrogen Cycle" scope, under the Evaluate section, there is a Claims-Evidence-Reasoning activity titled "Greenhouse Gases". In this activity, students write a scientific explanation after interpreting a graph representing the different types of gasses, the radiative force, and the time in years. The phenomenon displays an image of an algae bloom that results from too much nitrogen in the waters. The connection between the phenomenon and the "Greenhouse Gas Activity"

demonstrates that an interruption of the nitrogen and/or carbon cycle can result in an environmental change.

- Additionally, in the Elaborate section of the “Cellular Respiration and Photosynthesis” scope, students "explore connections and applications of using living cells to create building materials by reading and annotating an authentic, real-world article provided by *The Associated Press* (AP)." Students answer questions that assess comprehension. Through this opportunity to observe and analyze phenomena embedded within the materials, students develop content knowledge indicated in TEKS B.11A. Furthermore, the materials provide authentic application and performance of SEPs throughout the course content, as outlined in the TEKS. Materials provide students with different types of problems in the Elaborate section of each scope. For example, in the “Genetics and Inheritance” scope, problems are embedded throughout the science, technology, engineering, and math connections. These embedded problems provide authentic application and performance of SEPs and content knowledge as outlined in the TEKS.

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

- The materials intentionally leverage students' prior knowledge of phenomena and engineering problems. For example, in the Engineering Connection section of the “Interactions and Body Systems” scope, students develop an ankle brace to immobilize movement when bearing minimal weight. The teacher guidance includes criteria and constraints; these recommend that students explain how the brace supports the skeletal and muscular systems, which they learned about earlier in the scope. This guidance helps the teacher leverage students' prior knowledge regarding body systems to design solutions to engineering problems. Additionally, in the “Results of Evolution” scope, under the Engage section, a resource titled “Scope Phenomenon” provides a video titled "2021 COVID Mutation." Students watch the video and after they participate in a Think-Pair-Share to activate prior knowledge. This activity allows students to discuss what they already know about COVID mutation building a strong framework to scaffold the lesson.
- The curriculum materials also intentionally leverage students' prior knowledge and experiences related to phenomena and engineering practices using an engagement that is phenomenon based and a supplementary activity to activate prior knowledge before the introduction to the phenomenon. For example, in the Evidence for Evolution Scope, the curriculum materials have teachers leverage prior knowledge by doing the activity "Match Around the Room," in which pictures of fossil records, homologous structures, a cladogram, and three-lettered sentence definitions are each placed around the room. Students are then asked to review the images and sentences and "write the letter of the sentence that best matches each image next to the image number on the paper."
- Furthermore, the materials also accommodate for differences in students' prior knowledge by identifying common misconceptions. For example, the Pre-Assessment and Activating Prior Knowledge section of the DNA Scope lists some misconceptions that may be present in students' prior knowledge, such as thinking "base" refers to bases in sports and that enzymes are for cleaning.

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

- The materials outline the scientific concepts behind each phenomenon. For example, the Teacher's Background within each scope explains the scientific concepts behind the scope's phenomenon. For example, in the "Homeostasis" scope, the teacher reads about how the body reacts to stimuli to maintain stability, such as sweating when hot to maintain a cooler temperature. Materials include engineering problems in the Engineering Connection activity in the Elaborate section of each scope. In the "Plant Structures" scope, the Engineering Connection tasks students to design a hydroponic garden. The teacher guidance related to the scientific concepts in this activity states, "If students are stuck, use the following guiding questions: What type of medium will work best for giving roots the ability to grow and take up nutrients and water?"
- Materials include the phenomenon in the scope, "Results of Evolution" under the Engage section. It is titled "Scope Phenomenon." The phenomenon provides a description, materials needed, preparation, activity, identifying misconceptions, differentiation, and English Language Support Strategies, providing clarity to the teacher about the science concepts or goals of the phenomenon. Furthermore, in the Scope: Biomolecules, Engage: Scope Phenomenon, the Scope Description clearly states "The goal of this phenomenon and questioning activity is to engage students and to have them begin developing their understanding of which biomolecules are essential to living things."

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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. For example, in the Biomolecules Scope, under the Explore section, students use informational text on provided cards to complete the Structure and Function of Biomolecules Table. Later, in the Explain section, students read about how the structure and function of the biomolecules are connected to the structure and function of the cell, e.g., hydrophobic lipids comprise a semipermeable phospholipid bilayer cell membrane. In this way, the materials build on students' prior knowledge and support students' knowledge development within the Biomolecules unit.
- Furthermore, the "Standards Planning" section of each Scope identifies the knowledge that students acquired from units in previous years. For example, the Standards Planning page in the Scope: Plant Structures lists "7.13B: describe the hierarchical organization of cells, tissues, organs, and organ systems" as knowledge students were provided in middle school. This understanding of the hierarchical organization of multicellular organisms builds towards understanding content in the current Scope - specifically, the nature of plant tissues involved in transport, tissues involved in nutrient absorption, and the importance of cell structure concerning tissue function. This design allows students to build and connect their knowledge to the content of the current Scope.

- Also, in the "Vertical Alignment of Science TEKS" section, there is a Flashback area that lists TEKS that students have seen in previous science courses that align with the current Scope. For example, in the Scope: DNA Technology, under "Standards Planning and Vertical Alignment of Science TEKS," the Flashback lists, "8.13.B describe the function of genes within chromosomes in determining inherited traits of offspring." Students will connect the knowledge gained from this TEKS to the learning within the Scope. This can be seen in the student activity "DNA Technology Newscast," where students research information on DNA fingerprinting to solve crimes in forensics.
- The 5E format and the Interventions and Acceleration, or IA, section allows students to build their knowledge within and across units. For example, the Scope: Biomolecules is designed to cover the 5 E's in 8 days and allows a day for intervention and/or acceleration. The unit starts and is rooted in an engagement phenomenon where "Students will view an image of planets beyond the Solar System and a table that shows the percentage of elements in living organisms compared to the percentage of elements of the nonliving world." Teachers can use the Gallery Discussion as a strategy for engagement. The goal of this phenomenon and questioning activity is to engage students and to have them begin developing their understanding of which biomolecules are essential to living things." The materials then provide an exploratory activity that gives students a choice of a low-complexity digital lab activity overall biomolecules or a high-complexity laboratory activity over starch digestion to build their understanding.

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

- The curriculum materials are intentionally sequenced to scaffold learning to allow for increasingly deeper conceptual understanding through a combination of low-complexity and high-complexity activities, intervention and acceleration activities, and embedded content spiraling suggestions. For example, in Scope: Evidence of Evolution, the Explore activity options include a low complexity "Virtual Explore-Evidence of Evolution" and a high complexity "Explore-Scientific Explanations for Varying Rates of Change" and opportunities to spiral mechanisms of natural selection and results of evolution.
- The materials also utilize a progression of concrete representations before introducing abstract reasoning through the 5E model. The Engage activities include phenomena that illustrate concrete examples of the concepts within the Scope. For example, the phenomenon in the Plant Structures Scope depicts pollen flowing through the night sky. This is a concrete example students have witnessed, which is used to scaffold learning to make way for a deeper understanding of the plant structures involved in the phenomenon.
- Furthermore, each Scope is organized into a 5E lesson format. This format supports students' increasingly deeper conceptual understanding by beginning with an Engage that elicits prior knowledge of a concept and supports students' exploration of a concept before constructing an explanation. For example, in the Homeostasis Scope, during the Engage, the teacher elicits students' prior ideas by showing four images and asking which does not require the movement of molecules. Then students explore the movement of materials across a membrane using a decalcified egg as a model. During the Explain phase, students deepen their understanding of homeostasis by reading in STEMscopedia about the movement of molecules in hypo-, hyper-, and iso-tonic solutions, including reference to the images originally shown in the Explore. The Elaborate section comes next, where students strengthen their conceptual understanding as they read about human homeostatic processes, e.g., maintaining blood glucose levels and internal body temperature. This Scope supports students' increasingly deeper conceptual

understanding of homeostasis. Another example can be found in the Scope, Meiosis, and Reproduction, where in the Explore section, students demonstrate the process of meiosis and then continue their learning with the Explain section, in which students comprehend "grade-appropriate complex text about meiosis phases and how genetic variation results from meiosis." The 5E strategy continues to convey material with increasing complexity until the Evaluation of content mastery.

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

- Materials clearly and accurately present science and engineering practices(SEPs). For example, in the Homeostasis Scope, during the Engage, the teacher elicits students' prior ideas by showing four images and asking which does not require the movement of molecules. The images, also in the STEMscopedia, are of hypo-, hyper-, and iso-tonic solutions. They show differing amounts of dissolved solute, as represented by red dots. The "cell" in the solution is shown as a solid color or void of dissolved solutes. Learning proceeds with scope phenomena, where students watch a short animation of an antiport transport protein. Students engage by asking questions and defining problems based on their observation of phenomena, SEP B.1A, by responding to a question on their student handout, “How does this video show the cell interacting with substances outside the cell?” Where students also practice SEP B.3A, where students develop explanations supported by data and models. This is also evident in the Engineering Connection of the Cellular Respiration and Photosynthesis Scope, where students are asked to evaluate two different engineering designs of a self-contained agricultural pod for use on the International Space Station. The students read descriptions of the designs and then answer the questions, "Does the design meet all the criteria and constraints?" and "Does it solve the problem?" This evaluation, which satisfies SEP B.2D, evaluates experimental and engineering designs.
- Teachers can also find more information on SEPs under the “Instructional Supports” tab within “Teacher Resources." This provides an overview of the SEPs and their purpose as well as a set of “Science and Engineering Practice Cards - Secondary” that instruct the teacher on what students will be doing in each SEPs, as well as when it will be used, critical vocabulary, discussion prompts and where students struggle with this standard.
- Furthermore, the "Standards Planning" section presents SEPs addressed in each scope, including the TEKS identifier, where each SEP is located within the scope and follows with the SEP description. For example, within the Homeostasis Scope, under the “Standards Planning” tab, the “Scientific and Engineering Practices” sections clearly present that students will practice SEP B.1B within the “Engineering Connection” activity and provides the SEP description, “Apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems.” The section further describes all other connections to SEPs within the scope embedded in nearly every scope component. Additionally, in the scope Evidence of Evolution, “Standards Planning” section, content and scientific and engineering practices are listed, along with alignment to specific activities present in the scope. For example, SEP B.1A is present in the scope phenomenon, Explore Evidence of Evolution and Virtual Explore.
- Additionally, the materials clearly and accurately present course-specific science concepts within each scope under the “Teacher Background” tab. The information provides a general overview followed by specific information pertaining to all content taught within the scope. The scope materials further provide “I can” statements that provide a crystal clear picture of learning goals

within the scope, further providing clarity on the science concepts within the standards planning tab. For example, in the Biomolecules scope, under the “Teacher Background” Tab there is a general description of biomolecules which defines the four biomolecules and discusses how these components are responsible for the development of all living things. The guidance becomes more specific detailing the structure and function of each molecule as well as a detailed description of the role it plays within cells. Under the “Standards Planning” tab there is a general description of the scope, clear definitions of vocabulary terms and also lists “I Can” statements which provide clear learning goals as it pertains to each standard, such as ”I can explain the function of carbohydrates in a cell.”

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

- The mastery requirements are within the boundaries of the course's main concepts. At the beginning of each scope, a list of each TEKS will be covered within that scope. Learning objectives are identified and are consistent with each objective. For example, in the Cell Cycle and Specialization Scope, students "explain the importance of the cell cycle to the growth of organisms, including an overview of stages of the cell cycle and deoxyribonucleic acid (DNA) replication models" (TEKS B6.A). This is consistent with the Learning Objective, "Explain the stages of the cell cycle," and the Scope Assessment, which includes questions about what occurs during stages of mitosis.
- Furthermore, the materials include specific learning targets for each scope, which outline the boundaries of content students must master to be successful in the course. The "Home" section of each Scope includes a list of student learning objectives. For example, the DNA Scope includes the following objectives: "I can identify the components of DNA," "I can explain how traits are coded for in DNA," and "I can examine how science explains the origin of DNA." These objectives explicitly delineate the boundaries of the content students must master to be successful in the course. This can also be seen in the Scope: Evidence for Evolution in the Student Learning Objectives. This section includes student "I can" statements that outline the requirements for mastery of the scope. For example, the student learning objectives in this scope include, "I can examine evidence of common ancestry in the fossil record" and "I can examine evidence of common ancestry in various kinds of homologies." Also, in the Scope: DNA, the student objectives state, "I can identify the components of DNA.," "I can explain how traits are coded for in DNA.," and "I can examine how science explains the origin of DNA." These included learning objectives guide students as an indication of content mastery.

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Indicator 3.2

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

1	Materials support teachers in understanding the 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. This is evident in each scope's "Standards Planning" document, where the Vertical Alignment is embedded. For example, in the Prokaryotic and Eukaryotic Cells Scope, Vertical Alignment in Standards Planning supports teachers in understanding course-appropriate prior knowledge by identifying the Grade 6 TEKS, 6.13B, which requires students "identify and compare the basic characteristics of organisms, including prokaryotic and eukaryotic"; this guides students as they develop the course-level knowledge to "compare and contrast prokaryotic and eukaryotic cells, including their complexity" (TEKS B.5B). Importantly, when there is no relevant prior TEKS, that is also identified within the Vertical Alignment. For example, in the Biomolecules scope, Standards Planning, Vertical Alignment is "None"; this supports teachers in understanding the vertical alignment of course-appropriate prior knowledge by letting them know this information is new and not previously addressed in middle school TEKS. Another example of the materials' support is found in the Scope: Mechanisms of Natural Selection on the Standards Planning page under the section Vertical Alignment of Science TEKS. This section provides the grade level and TEKS for the prior knowledge to support new learning for students. For example, this scope includes

TEKS, "8.13C describe how variations of traits within a population lead to structural, behavioral, and physiological adaptations that influence the likelihood of survival and reproductive success of a species over generations." This is vertically aligned with TEKS, "B.10A analyze and evaluate how natural selection produces a change in populations and not in individuals," which also supports the science and engineering practice TEKS, "B.1A ask questions and define problems based on observations or information from texts, phenomena, models, or investigations."

- The curriculum materials support teachers in understanding the vertical alignment of course-appropriate prior knowledge and skills guiding the development of scientific and engineering practices. This can be seen in the Scope: DNA, on the page Standards Planning, under the section Vertical Alignment of Science TEKS, where teachers are provided with the Science and Engineering Practices that align to the activities in the DNA scope. This scope covers the following SEPS; B.1A, B.1B, B.1F, B.2A, B.2B. B.3D, B.3A, B.3B, B. 3C, B.4A, B.4B, and B.4C via projects and activities embedded throughout the 5E + IA curriculum framework.

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.

- The materials contain explanations and examples of science concepts, including grade-level misconceptions, to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS. For example, in the Homeostasis Scope, during the Engage, the teacher elicits students' prior ideas by showing four images and asking which does not require the movement of molecules. The images are of hypo-, hyper-, and iso-tonic solutions. The accompanying teacher resources include a section titled, Identifying Misconceptions that describes potential misconceptions associated with each image, e.g., in Image 1, "students may not realize that concentration drives the direction of molecular movement, and water will move into the cell." This section also helps teachers recognize potential barriers to students' conceptual development; in this case, the materials suggest that teachers ensure students understand the word cell in context since cell has multiple meanings in different contexts.
- Furthermore, the materials provide a "Pre-Assessment and Accessing Prior Knowledge" page in the Engage portion of each Scope. This page outlines misconceptions students may have about grade-level concepts. For example, the DNA Scope identifies the misconception that "tRNA can transfer genetic material from one organism to another." By providing examples of such misconceptions, materials support teachers in recognizing barriers to student conceptual development of content outlined in the TEKS. Another example of the pre-assessment can be found in the DNA Technology Scope. In the Engage section, under Pre-Assessment and Accessing Prior Knowledge, there is a section called Identifying Misconceptions, which includes indications of misconceptions by students. For example, one of the misconceptions for this scope states, "Prompt 1: Students may believe that Dolly was a perfect clone and that cloning one animal means we can clone any animal." The teacher's ability to identify student misconceptions helps to guide the instruction towards developing student understanding of the importance of molecular technologies, gel electrophoresis, and genetic engineering that are applicable in current research and engineering practices. A third example can be found in the Homeostasis Scope within the Identifying Misconceptions activity. In this activity, teachers are instructed to prepare one set of the Four Corners images for the classroom and a copy of the pre-assessment for each student. The teacher then hangs up the images around the room and "Asks students to look at the four corners and think about which corner image best explains which representation

doesn't require the movement of molecules." and discusses the results. The second part of the activity includes a timed pre-assessment. Within the teacher's guidance in Identifying Misconceptions, there are clear directions/insight into common misconceptions by students and how to combat them within the classroom discussions. These three examples show that The materials contain explanations and examples of science concepts, including grade-level misconceptions, throughout the content 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.

- The materials explain the intent and purpose of the program's instructional design in the Resources; under STEMscopes Framework, a STEMscopes Pedagogy document can be found. This Pedagogy document explains that the STEMscopes program "is a tightly and 100% TEKS aligned, online curriculum, which provides a complete, coherent, and supported pathway for the academic success of students using an enhanced 5E instructional model." The document explains that the goal is "to provide an inquiry-based curriculum, which incorporates the research-based, constructivist phases" of the 5E model to address the TEKS and provide support for the ELPS. The STEMScopes Pedagogy document also includes a rationale for using the IA Instructional model. The material includes evidence of instructional approaches and references research-based strategies, such as, "The development of the STEMscopes 5E+IA model in the delivery of science online curriculum takes into account the research of the National Research Council in their publications How People Learn (2000) and How Students Learn Science in the Classroom (2005)." Furthermore, the Pedagogy document states that "The 5E Instructional Model and the additional Intervention and Acceleration (+IA) within the resources provide teachers additional opportunities to identify and close the gaps in student content knowledge that lead to achievement gains, as well as provide enrichment activities for other content areas linked to science content." These examples clearly show that the material identifies and explains both the intent and goals of the program's instructional design.
- Materials further explain the program's intent and goals for using the 5E framework within each scope. For example, in the Biomolecules Scope, each phase of the 5E lesson is preceded by a description, i.e., "This element [Engage] is designed to uncover student misconceptions and provides a measurement of student learning to act as a baseline." During the Engage phase of the Biomolecules scope, students agree or disagree with statements in a given scenario about a school cafeteria's new health-conscience menu. The preceding description in the teacher resources further clarifies the purpose by stating responses are a baseline and "should not be taken for a grade.

Accelerate Learning STEMscopes Biology Texas

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.

- The materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists through every inquiry-driven scope. For example, in the "Genetics and Inheritance" Scope, the "Explore" tab has an activity titled "Genetics and Inheritance" where students "will crossbreed flowers to get a better understanding of genetics and inheritance" and "determine how genotype influences phenotype as well as the effects of dominance and incomplete dominance." Students read through the instructions provided and record their data to answer guiding questions using their data. For example, students will see the following question, "Can appearance be used to determine genetics?" and are instructed to "Use evidence from the activity to support your answer." This structure provides opportunities for students to make sense of the subject through reading, writing, and thinking like a scientist. Another example is in the "Evaluate" section of the Scope "Mechanisms for Natural Selection,"

where students utilize data and a scenario to explain in the Claim-Evidence-Reasoning format. In this activity, students must utilize provided data and the scenario "A scientist was studying mice populations as drought was happening in their ecosystem. They counted individual mice as the habitat went from green and lush to the dried-out tan of dead vegetation. Below is the data from the scientist's study. What does the study indicate, and how does it connect to natural selection?" to complete their response.

- The materials also consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as engineers. For example, in the Scope "DNA Technology," there is an "Engineering Connection" activity in the "Elaborate" tab. In this Engineering Connection, students focus on the first three steps of the Engineering Design Process (EDP) to develop a genetic plan for a farmer with "Highland cows in Scotland." Students are charged with designing a breeding plan to produce offspring with extra horn length that are milk producers, are disease free, and have a good disposition. The material design supports students to utilize the EDP as they complete the activity, such as guiding questions for struggling students and an extension the teacher can assign where students are asked to complete all steps of the EDP. Furthermore, during the "Elaborate" section of the "Prokaryotic and Eukaryotic Cells" Scope, students use their "knowledge of prokaryotic and eukaryotic cells and organelles to design a cell that can survive and grow in extreme conditions." This activity engages students in three phases of the Engineering Design Process as they make sense of cells.

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 opportunities for students to engage with grade-level appropriate scientific texts to gather evidence and develop an understanding of concepts in every Scope through the STEMscopedia readings. Each Scope contains relevant reference material for each Scope in the "STEMscopedia" document of its Explain section. This text contains embedded questions that prompt students to gather evidence and develop an understanding of concepts contained within the text. For example, the STEMscopedia in the "Cellular Respiration and Photosynthesis" Scope asks, "How would the energy transfer be affected if there were fewer producers?." This question allows students to find evidence within the previous text and develop their understanding of the energy cycle between photosynthesis and cellular respiration. Another example can be found in the STEMscopedia of the "Evidence for Evolution" Scope, where students are given several grade-level scientific texts to read and answer questions providing evidence from the text. One such text is "The Fossil Record," which includes an image of rock strata with fossils followed by the question, "What do you think is happening when a new species suddenly appears in the strata?." To answer the question, students must gather evidence utilizing the image. This helps students to develop an understanding of the concept that older fossils are at the bottom while younger fossils are at the top of the strata.
- Furthermore, the structure of each Scope allows students to develop an understanding of biological concepts requiring reading scientific text. For example, in the Scope "Ecological Relationships," students brainstorm to begin understanding an African food web. Then, students explore ecological relationships using a card sort activity and read about ecological relationships and nutrient cycling via the STEMscopedia reading. Students complete a Claim-Evidence-Reasoning writing activity or scope assessment to evaluate their learning.
- Another location where the materials provide opportunities for students to engage with grade-level appropriate scientific texts to develop an understanding of concepts can be seen in the "Elaborate" tab. For example, in the "Biomolecules" Scope, during the "Elaborate," students

read about biomolecules in milk and use a claim and evidence map to provide evidence for two claims: "Claim 1: Chocolate milk contains several types of biomolecules, and Claim 2: Chocolate milk is a reasonable choice as a sports recovery drink." This text, available at grade level and one grade level below, is an example of a grade-appropriate text that helps students develop conceptual understanding.

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.

- 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 can be found throughout the material. For example, during the "Explain" phase of the "Biomolecules" Scope, students take notes in their Interactive Science Notebook. Students skim the text for words they do not recognize and write possible definitions. After reading and discussing, they revise their definitions. Another example can be found in the Scope "Meiosis and Reproduction" where, in the "Explore" action, an activity called "Pool Noodle Meiosis and Fertilization" has students create a flowchart to show the sequence of meiosis and fertilization. In addition to the flowchart, students write each sequence step and connect the boxes with arrows to show the correct order. This activity supports the students' academic development by having students communicate their understanding in various ways.
- Materials also provide opportunities for students to support their development of scientific concepts through various modes of communication by allowing them to draw their observations and describe them verbally. For example, the "Plant Investigation Stations" activity in the "Explore" section of the "Plant Structures" Scope challenges students to write observations that "include writing and drawing with labels." Opportunities such as this allow students to display their understanding of scientific concepts as they develop.
- Additionally, in the Scope "Changing Biodiversity," under the "Explain" tab, the "Interactive Science Notebook" section instructs teachers to have students create concept definition maps for the effects of human activities on biodiversity and ecosystem stability in their student interactive notebooks and create a list of three details and examples of the concept to build their maps.
- These multiple opportunities to engage with the text in writing, reading, and discussion support students' 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.

- Material includes support for 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.
- Students act as scientists when the materials provide opportunities for them to learn from inquiry, make sense of concepts, and productively struggle. These opportunities are provided at the beginning of each Scope through the presentation of a phenomenon that sparks student inquiry. For example, the "DNA" Scope the phenomenon provided is a diagram that illustrates the organization of DNA in a human somatic cell. Students investigate the diagram by observing

its components and the provided information. Then students answer relevant questions in the handout provided.

- Students also act as engineers and engage in the engineering design process. For example, in the Scope "DNA Technology," there is an "Engineering Connection" activity in the "Elaborate" tab. In this Engineering Connection, students focus on the first three steps of the Engineering Design Process (EDP) to develop a genetic plan for a farmer with "Highland cows in Scotland." Students are charged with designing a breeding plan to produce offspring with extra horn length that are milk producers, are disease free, and have a good disposition. The material design provides support for students to be able to utilize the EDP as they complete the activity, such as guiding questions for struggling students, as well as an extension the teacher can assign where students are asked to complete all steps of the EDP. Another Engineering Connection can be found in the Scope "Changing Biodiversity," where students create a model that can be used to track changes to the biodiversity of an ecosystem as a result of an oil spill. The materials provide opportunities for students to productively struggle by providing resources for students to analyze their processes when their engineering prototypes or models fail to meet the criteria and or design expectations. The "Elaborate" section of the materials also supports students to act as engineers. For example, during the "Elaborate" section of the "Prokaryotic and Eukaryotic Cells" Scope, students use their "knowledge of prokaryotic and eukaryotic cells and organelles to design a cell that can survive and grow in extreme conditions." This activity engages students in three of the phases of the Engineering Design Process as they make sense of cells.

Accelerate Learning STEMscopes Biology Texas

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 prompt students to use evidence to support their hypotheses and claims through using Claim-Evidence-Reasoning writing activities incorporated into the end of each Scope. Students analyze a prompt, then create a claim in response. They use the knowledge gained throughout the Scope and data provided by the scenario as evidence. For example, in the Plant Structures Scope, the Evaluate section includes a Claim-Evidence-Reasoning (CER) activity where students respond to the following prompt: "Write a scientific explanation that explains how structures in plants facilitate the interactions that occur among plant systems." Students use data from a table and text from a scenario as evidence for their claims. Another example of where the materials use CER is in the DNA Technology Scope; in the Evaluate section, there is a Claim-Evidence-Reasoning (CER) activity where students read a scenario about COVID-19 Testing and answer the following prompt using CER, 'Write a scientific explanation that explains which test would be best for determining if a person currently has COVID-19." The students pull evidence from the provided scenario to support their claim.

- The materials also prompt students to use evidence to support their hypotheses and claims within the Homeostasis Scope, where students read a scenario about how the human eye acts as a semipermeable membrane that allows the flow of oxygen and then “construct and support an argument that explains how oxygen travels into the human eye” using a claims evidence reasoning format. The teacher materials guide teachers to prompt students to use evidence from the article in supporting their claim with evidence, noting, “For the evidence section, students should cite data or observations that can be pulled directly from the scenario and external data.”
- The materials specifically prompt students to use evidence when supporting their hypotheses and claims. For example, in the Scope, Changing Biodiversity, students participate in an argumentative writing task where they examine the models of three ecosystems that have gone “through changes as a result of the amount of rainfall that fell over three years.” They then must develop an accurate claim, such as “Ecosystems with more biodiversity will have more stability than those with less biodiversity.” and use evidence from the three model ecosystems to support the claim. The materials state that the evidence could include ."..Species A did poorly during the dry year but did well during the rainy year. Species B did poorly during the rainy year but well during the dry year. The same effect was seen in both species when they were together in Ecosystem 1.” Another example can be seen in the Meiosis and Reproduction Scope, where, in the Elaborate section, there is a “Writing Science” activity where students read information and write an essay. For this example, students, “Write an essay that explains how the key steps in sexual reproduction lead to genetic variation.” One of the areas within the rubric states, “The writer had a clearly defined main idea and backed it with a logical sequence of supporting details.”

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

- Materials include embedded opportunities to develop and utilize scientific vocabulary in context. The materials present scientific vocabulary using multiple representations. In the Biomolecules Scope, during the Explore, students read about and view multiple representations of biomolecules. For example, carbohydrates, lipids, and proteins are represented as foods in a food pyramid. The basic structure of all biomolecules is described and drawn as a polymer chain consisting of monomers. Finally, the specific chemical structure of each biomolecule is described and drawn. Examples of drawn carbohydrates include mono-, di-, and polysaccharides.
- Another opportunity that helps students develop and utilize scientific vocabulary in context of the material can be found within the “Explore” activities of each scope. These activities allow students to practice using scientific terminology in the context of the lesson. For example, in the DNA Scope, the Explore portion of the lesson has an activity called Edible DNA, where students build a DNA model using candy. In doing so, students utilize necessary scientific vocabulary, such as nucleotides, nitrogenous bases, deoxyribose sugar, etc. And in the Scope, Ecological Relationships in the Explore activity: Ecological Relationships, ."..students will use cards to match ecological relationship scenario pictures with the name of each relationship shown.” Later on in the scope, during the explain lesson, the teacher posts interactive word wall slides on an open wall in two columns (words and pictures and definitions) and has students use yarn and push pins to have students connect the correct term/picture with the correct definition, using what they have learned from previous unit activities.
- Furthermore, in the Scope, Meiosis, and Reproduction, the Explain portion of the lesson includes “Picture Vocabulary.” This section includes a student activity, “Rolling Through Vocabulary,” where students take turns rolling dice to carry out an activity for a particular vocabulary term.

For example, one of the vocabulary terms includes “Meiosis,” and activity is to “Draw a representation of the term.” This student activity allows students 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 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 integrating argumentation and discourse within stages of the learning cycle, supporting student development of content knowledge and skills. For example, in the Diseases Scope, during the Elaborate phase of the learning cycle, students “research the risky behaviors of tobacco use, alcohol use or drug use, and the diseases associated with them” and then “create public service announcements (PSAs) to educate people about the relationship between different types of diseases that are associated with tobacco use, alcohol use, or drug use.” In this way, students engage in evidence-based argumentation.
- Another example can be found in the Scope, Evidence for Evolution, where in the Engage portion of the lesson, students are introduced to a Scope Phenomenon, “The Thinker,” for classroom engagement. The phenomena is a video that students observe and utilize to answer questions. One of the questions in the example includes, “What do you think could be a problem when analyzing DNA from bones that are 10,000 to 20,000 years old”? This question produces argumentation and discourse to support students’ development of the content.
- Furthermore, many activities provide opportunities for group work, allowing students to discuss their answers to questions and explain their reasoning. For example, in the Scope: Plant Structures, the Explore section has an activity titled “Plant Investigation Stations,” where students question one another using questions they create and submit to the teacher. Such questioning activities integrate argumentation and discourse as students respond to one another.
- Students also participate in argumentative writing tasks. For example, in the scope Changing Biodiversity, students participate in an argumentative writing task where they examine the models of three ecosystems that have gone ".. through changes as a result of the amount of rainfall that fell over three years.” Students then must develop an accurate claim, such as “Ecosystems with more biodiversity will have more stability than those with less biodiversity.” and use evidence from the 3 model ecosystems to support the claim.

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 using evidence acquired from learning experiences. One way the materials do this is by providing opportunities for students to justify explanations of phenomena using written arguments with evidence acquired from their learning experiences. The Interactive Science Notebook (ISN), embedded within the Explain phase of each Scope, "provides reflection opportunities for students to process the content they learned by doing the Explores and from reading the STEMscopedia." For example, in the Homeostasis Scope, students create a folded graphic

organizer within the right side (input side) of ISN to explain osmosis, diffusion, facilitated diffusion, and active transport. They write " important facts about each type of cell transport and illustrate each process." Students also create a concept map within the left side (output side) of the ISN, that "describes cell transport and its role in maintaining homeostasis from the Explore activity." In this way, the materials help students justify explanations of phenomena using written arguments with evidence.

- Another example is seen in the Scope: Changing Biodiversity; under the Elaborate tab, students are tasked with writing an essay that."..explains how human activity impacts the biodiversity of an ecosystem and how this affects the stability of an ecosystem" where they must clearly present their controlling idea, and organize and develop their explanation choosing their words carefully and using scientific vocabulary. Additionally, within the unit, under the Elaborate tab, students are tasked with creating a one-minute ling PSA answering the driving question, "How do invasive species affect the biodiversity of an ecosystem?" Students must research and include within their PSA information about the balance between biotic and abiotic factors in an ecosystem, an explanation of invasive species, and how gardening plants are changing ecosystems and negatively affecting biodiversity.
- Further evidence can be found within the “Evaluate” position of each Scope. The "Evaluate" section formally assesses student learning through the implementation of a Claim-Evidence-Reasoning (CER). During the CER, students write a claim that explains a phenomenon related to the Scope and use the knowledge gained throughout the Scope and data provided by the scenario as evidence. For example, in the DNA Scope / Evaluate / Claim-Evidence-Reasoning, students respond to the following prompt: "Write a scientific explanation that explains why some individuals can digest lactose while others cannot." Students synthesize knowledge about DNA, gene expression, and enzymes to justify their explanation of the scientific phenomenon.
- The materials provide opportunities for the students to construct and present developmentally appropriate written and verbal arguments that justify solutions to problems using evidence acquired from learning experiences. For example, in Scope: Mechanisms of Natural Selection, in the Elaborate section of the lesson in the “Engineering Connection," students use the Engineering Design Process (EDP) to model mechanisms of natural selection with a population game using the species of the javelina. For this activity, students will provide a solution to the problem relying on evidence from learning experiences.

Accelerate Learning STEMscopes Biology Texas

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 teachers with possible student responses to questions and tasks that support students during lessons and investigations. This can be seen in the Scope: Changes in Biodiversity. In this scope, students study how environmental changes affect biodiversity within an ecosystem. The associated activities within the scope provide teacher guidance for preparation, starters, and differentiation. Within the activities of the scope, leveled questions and exemplar student responses to questions are provided. For example, in the Explore tab, the starter activity is a "Think Pair Share." During the Share portion, teachers are prompted to ask the question, "Name a human activity that causes air pollution." and include the exemplar student response, "Burning fossil fuels, such as coal, oil, and gas, and exhaust from automobiles cause air pollution." Another example can be seen in the Cellular Respiration and Photosynthesis Scope in the Explore portion of the lesson. This section includes an activity titled "Modeling Photosynthesis and Cellular Respiration," where students "model the reactants and products of both photosynthesis and cellular respiration. Students will then explain how these processes conserve matter and transfer energy." The teacher supports students during this activity by asking questions, and the material provides possible student

responses. For example, the materials state, “A student may respond with ‘chloroplast’ when asked ‘What organelle is responsible for absorbing sunlight in a plant cell?’."

- The materials provide possible student answers and teacher guidance on how to respond to those answers, including how to build on student thinking. For example, in the Scope: Biomolecules, during the Engage section, students read a scenario about a school’s cafeteria changing its menu and sample student responses about which changes are healthiest. Students are then tasked with communicating if they agree or disagree with the responses from the reading. The teacher's guidance suggests, “If a student believes Julia is correct or Erica is incorrect, they may need more instruction on the importance of carbohydrates for short-term energy and the difference between fruits and vegetables and between whole grains and refined carbs.”
- Another example is found in the DNA Technology Scope, within the Explore section, in an activity titled “Explore: DNA Manipulation Research." This activity includes teacher guidance on predicting possible student answers. The material also includes teacher support for deepening student thinking by providing Advanced Strategies that challenge students to think about the content from a different historical person, “For example, what would Marie Curie or Katherine Johnson think about the current topic of study?”

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

- The materials provide embedded teacher support on scaffolding students’ development of scientific vocabulary related to concepts through implementing the 5E model. Concepts and some vocabulary are introduced through the Engage section. Students then move to the Explore phase, where they investigate the concepts and thereby increase their knowledge of the concept. Students gain a firm understanding of vocabulary in the Explain section and deepen their understanding by applying the concept and vocabulary within the Elaborate section. The learning students acquired during the lesson is then assessed in the Evaluate section. An example of the 5E model is evident in the Plant Structures Scope, where students first engage with the phenomenon of plant reproduction (pollen drifting through the night sky). Students then Explore the concept and vocabulary through plant investigation stations. Within these investigations, students study plant structures and reproduction in more depth. An in-depth explanation is provided through the STEMscopedia reading, which includes the vocabulary in context. This progression scaffolds students’ development of vocabulary.
- More specifically, the materials include teacher guidance on scaffolding and supporting students’ development and use of scientific vocabulary in context in the Engage section of each lesson through the “Picture Vocabulary.” In the Homeostasis scope, the Explain portion of the lesson includes “Picture Vocabulary Slides” for each term introduced in the Explore. The materials suggest that teachers “encourage students to practice using these terms in context during subsequent scope activities.” In this way, the materials guide teachers in scaffolding students’ vocabulary development.
- In the Explore portion of each lesson, there is a section titled “Virtual Explore,” which includes a list of the vocabulary students will utilize in the Scope. For example, in Scope: Meiosis and Reproduction, the “Virtual Explore” includes a list of the vocabulary students will utilize within the assignment that includes “crossing over, diploid, gametes, haploid, homologous chromosomes, independent assortment, meiosis, mitosis, somatic cell, and zygote.” The materials provide teacher guidance, as evidenced by the statement, “Students should be

encouraged to use these terms in their Interactive Science Notebooks (ISN)s and their responses to questions."

- Another example can be seen within the Explore section. For example, in the Scope: Ecological Relationships, there is an Explore activity titled "Ecological Relationships" where ."..students will use cards to match ecological relationship scenario pictures with the name of each relationship shown." Later in the Explain portion, the teacher is directed to post interactive word wall slides on an open wall in two columns (words and pictures and definitions) and has students use yarn and push pins to connect a term/picture with the correct definition, using what they have learned from previous unit activities. Furthermore, the materials provide "Teacher Tiered Intervention Strategy" guidance which states that teachers should provide support for Tier 1 students by "Vary[ing] the size of the group to complement the student's ability to work with others (i.e., with a partner, 3-4 peers, or 5+ classmates)." and provide support for Tier 2 students "Ask the student to identify a peer or choose the group in which they will participate. Interact frequently with the student to maintain their involvement in the group activity."

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 can be seen in how the materials instruct teachers to prepare by setting up and reinforcing a class culture in which 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 building off of one another's ideas in pairs, small groups, and whole group discussions. This can be seen in the Cell Cycle and Specialization Scope within the Elaborate portion of the lesson. This lesson section has an activity called the "Science Connection," where students "create skits depicting cell-cycle regulation." The materials instruct teachers to "remind students that, while other groups are performing, they should be good audience members and perform active listening and polite applause, and they should ask appropriate questions after the skits." This helps students practice listening to one another in whole group discussions. Another example can be found in the Scope: Ecological Relationships, where in the Explore: Ecological Relationships Activity-Starter, the materials instruct the teacher to "use question prompts at the beginning of the Explore activity to gauge current student knowledge and identify any potential misconceptions." Students then work in pairs in the Think-Pair-Share activity where they are asked a question, think about and construct an answer, and then with their shoulder partner, share their answers, encouraging "...students to build one another's thoughts." Multiple questions are included in the curriculum materials for teachers to ask students, such as "What are ecological relationships? What are symbiotic relationships? Can an ecosystem be affected if one species in an ecological relationship suffers an impact, such as disease? Explain your answer."
- The materials also provide teacher support to prepare for student discourse by providing a list of possible questions to initiate discourse. For example, in the Body Systems Interactions Scope, the Engage section of the lesson begins with a Scope Phenomenon activity, where students view images of each body system and discuss their observations. To help guide this discussion, materials provide questions teachers can utilize, including "How do the digestive and the circulatory systems interact with each other?" and "How do the respiratory and circulatory systems interact with each other?"
- Furthermore, teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims is evident in the Claim Evidence Reasoning

activities. For example, in the Scope: Genetics and Inheritance, the Evaluate portion of the lesson has a Claim Evidence Reasoning activity that instructs teachers to have students "construct and support an argument that explains why there are four different phenotypes for blood types." This example demonstrates the teacher's guidance to facilitate student discourse.

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

- Materials support and guide teachers in facilitating the sharing of students' thinking and finding solutions through providing feedback tips and examples teachers can use to support students throughout the learning cycle. For example, in the Prokaryotic and Eukaryotic Cells Scope, during the Elaborate portion of the lesson, in the "Engineering Connection" activity, students "design a cell that can survive and grow in extreme conditions." Before planning, the teacher encourages students to brainstorm multiple ideas and not limit themselves to the first idea. The materials suggest that if students become stuck during planning, the teacher asks two questions: 1) "What are the two ways you could include DNA in your cell? ... [and] 2) The organism needs to photosynthesize. What organelle will that require?" This teacher guidance facilitates students in thinking throughout the Engineering Design Process, including finding solutions.
- The materials also provide teacher support and guidance to engage students' thinking by providing various modes of communication throughout the course. Students are encouraged to convey their learning in writing and visually throughout the course. For example, materials provide an activity called "Science Art." In the DNA Scope, in the Acceleration tab, there is a "Science Art" activity where "students will create DNA timeline drawings that illustrate the history of the discovery of DNA." Activities that incorporate graphics, such as found in this example, facilitate the sharing of student ideas visually.
- Furthermore, "Science Today" activities provide teachers with support and guidance. For example, in the Scope: Evidence for Evolution, the Elaborate section has a "Science Today" activity that guides teachers to have their students explore connections and applications of examining fossils of a prehistoric bird. The students use a response log to answer questions and answer reflection questions. The activity also guides teachers to have students "pair up and exchange their initial thoughts from their response logs."
- Additionally, the materials provide examples of student-written responses and answer keys. The materials state that teachers should use these sample responses as a guide to help students show their thinking through writing. For example, a Claim-Evidence-Reasoning activity is found in the Scope: Ecological Relationship in the Evaluate tab. This activity provides students with a graph that shows the relationship between moose and wolf populations on Isle Royale, located in Lake Superior. Students are prompted to "Write a scientific explanation that describes how ecological relationships affect ecosystem stability." using evidence to support their claim. The materials provide sample student responses, including, "The data shows the ups and downs of the moose and wolf population. Between 1965 and 1970, the wolf population decreased, which caused the moose population to increase. From 1970 until 1980, the wolf population went up, then sharply dropped because there was not enough prey available."

Accelerate Learning STEMscopes Biology Texas

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

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

Materials include a range of diagnostic, formative, and summative assessments 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. One diagnostic assessment the materials provide is a pre-assessment. Teachers can find the pre-assessment within the Engage phase of each scope. For example, in the Biomolecules Scope, students "read different student responses to a posed question on biomolecules, decide whether they agree or disagree with the student, and explain their reasoning. They ... [are] assessed on their current knowledge of the content covered by this scope through a multiple-choice pre-assessment. This element is designed to uncover student misconceptions and measure student learning to act as a baseline." This is a diagnostic assessment, and the teacher guidance reminds teachers not to use it for a grade.
- The materials also include formative assessments in various formats within each scope. The purpose of these assessments is to measure student learning and determine the next steps for instruction. For example, the Cellular Respiration and Photosynthesis Scope contain a phenomenon inquiry activity, a CER activity, a model building activity, and several more inquiry-based activities, allowing teachers to assess students formatively.
- Furthermore, the materials include a variety of summative assessments as well. For example, in the Meiosis and Reproduction Scope, the Evaluate section contains a Scope Assessment:

"Students will be assessed on the knowledge gained after completing the activities in the Engage, Explore, Explain, and Elaborate section of the scope." The material includes an end-of-scope assessment in a digital and printable format that assesses student learning.

- Additionally, the materials include opportunities for teachers to collect information about what students are learning from the materials and use it to plan future lessons. For example, in the scope Results of Evolution, under the Evaluate tab, there are two student assessments, a Claim-Evidence-Reasoning, and a Scope Assessment. Both assessments include an answer key with rubrics for a constructed written response. The answer key for multiple choice questions provides answer justification for correct and wrong answers to help address content misconceptions and aid in planning for future lessons.

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

- Materials assess all student expectations over the breadth of the course and indicate which student expectations are assessed. The authors present the materials through Scopes. Each scope is presented in a 5E lesson format and centered around a group of TEKS. Teachers can find the specific TEKS the Scope covers within a detailed TEKS-based lesson plan that outlines how they can use the materials to teach particular concepts and skills and address students' expectations and guidance on assessing student learning. Furthermore, each scope begins with a Standards Overview with a Standards Planning page. For example, the Diseases Scope addresses the following TEKS: "B.5D compare the structures of viruses to cells and explain how viruses spread and cause disease [and] B.6C relate disruptions of the cell cycle to how they lead to the development of diseases such as cancer." The lesson plan provides opportunities to explore and read about infectious diseases and uncontrolled cell growth. The scope ends with a multiple-choice assessment to assess students' knowledge of these concepts. For example, the multiple-choice assessment found in the Diseases Scope includes a question that asks, "Which statement best explains how viruses cause disease? [and] An interruption in the cell cycle can lead to which disease?" In this way, the materials indicate student expectations, provide lesson plans that support students' learning, and assess students' learning.
- Another way the materials assess all student expectations, as outlined in the TEKS, throughout the course is found in the Texas Standards Snapshot. This document is a cohesive scope and sequence that teachers can find within the materials' resources tab. From this tab, teachers navigate to Planning with STEMscopes, then Grade Level Standards, click the book icon and see the Texas Standards Snapshot. This snapshot outlines what teachers will teach in a specific course. For example, the snapshot shows that the third scope is Homeostasis and covers TEKS 5C.
- Additionally, the Scope Matrix clarifies how the materials assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment. For example, in Scope DNA Technology, under Standards Planning, the Texas Science TEKS that applies to the scope can be found in the Scope Matrix. The Scope Matrix lists each TEKS that the scope covers and all activities that allow students to work on a specific TEKS. For this scope, the Content Standard is B.7D, of which Science Today, Reading Science, Writing Science, Virtual Experience, Content Connection Videos, and Scope Assessment activities apply to said TEKS.
- Furthermore, the materials indicate which student expectations are assessed in the student Progress Monitoring and Reflection Log and within the Scope Assessments Answer Keys, where each question shows the TEKS it is aligned to. For example, in the Scope Ecological Relationships, the Scope Assessment Key has a chart on the first page showing every question by

number, the item type, TEKS (standard), DOK level, whether or not it contains a stimulus, and whether or not the question is auto-graded.

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

- The materials include assessments requiring students to integrate scientific knowledge and science and engineering practices appropriate to the student's assessment expectations. For example, in the Prokaryotic and Eukaryotic Cells Scope, students use their knowledge of prokaryotic and eukaryotic cells to engage in scientific argumentation during the Evaluate phase when they are asked to "construct and support an argument that endosymbiotic theory is a viable theory" using a Claims, Evidence, Reasoning (CER) format. This assessment also requires that students engage in the SEP of developing explanations supported by data. The teacher's guidance recommends students cite data from the given scenario and external data. Thus, this CER assessment requires students to integrate scientific knowledge and science practices.
- Another example of how the materials include assessments that require students to integrate scientific knowledge and science and engineering practices can be found in the Engage section of each Scope, where students practice scientific inquiry when introduced to each Scope Phenomenon. Students investigate the phenomenon, ask questions, formulate hypotheses, then share and discuss their findings. For example, in the Engage section of the Plant Structures, students are introduced to a Scopes Phenomenon, where students investigate pollen floating through the night sky. Students are required to understand the content of TEKS 12B and utilize the SEPs by asking questions, making observations, and creating potential hypotheses and explanations about how or why plants do this. These inquiry-based activities allow teachers to assess student knowledge while integrating science and engineering practices.
- Furthermore, the materials include summative assessments integrating scientific concepts and science and engineering practices. For example, in the Scope: Genetics and Inheritance, the Evaluate section includes a Scope Assessment. This assessment includes questions with embedded Science and Engineering Practice (SEP) standards. In the Scope Assessment’s Rubric and Answer Key, the TEKS correlation indicates that questions 4, 5, 6, 9, and 10 contain SEP standards.
- Additionally, the Elaborate section of each scope includes assessments requiring students to integrate scientific knowledge and science and engineering practices where various activities are connected to engineering, technology, math, reading, and writing. For example, in the Scope: Ecological Relationships, under the Elaborate tab, there is an Engineering Connections activity that has students “...focus on the first three steps of the Engineering Design Process ... to design a filtering system to remove microplastics from oceans or freshwater ecosystems."

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, during the Elaborate phase of Diseases Scope, students apply their developing knowledge of viruses to "reflect on the influenza pandemic of 1918. Using modern constraints and protections, ... [students] design a plan that would contain the influenza pandemic to one continent once discovered."
- Another example can be found in the "Science Today" activities, which provide an opportunity for assessment while students are introduced to new phenomena from a recent science news article. For example, in the DNA Scope, the Elaborate tab includes a Science Today activity that

introduces how scientists evaluate genomes. Students apply their content knowledge to the new information as they answer questions about the passage.

- The Evaluate section of the materials also includes assessments that require students to apply knowledge and skills to a novel context. For example, in Scope: Evidence for Evolution, the Evaluate section consists of a Scope Assessment where students demonstrate and apply their knowledge and skills to answer the questions correctly. For example, one of the questions in the assessment displays the developing embryos of a shark, lizard, chicken, pig, and human. The question asks, "Which statement best supports the observable structures in the embryos?." Students use their knowledge and skills developed from the scope to explain.
- Materials include assessments within the Explain section that require students to apply knowledge and skills to novel contexts (phenomena). For example, in the scope Changing Biodiversity, the Explain section of the lesson includes an Engineering Connection activity where "Students will focus on the first five steps of the Engineering Design Process (defining the problem, brainstorming, planning, building, and testing) to create a model that can be used to track changes to the biodiversity of an ecosystem as a result of an oil spill."

Accelerate Learning STEMscopes Biology Texas

Indicator 6.2

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

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

Meets | Score 2/2

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

Materials include information and/or resources that provide guidance for evaluating student responses. Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level. Assessment tools yield relevant information for student self assessment that teachers may 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. This is evident in the Scope Assessment Answer Key. For example, the Assessment Answer Key provides a short response scoring guide in the Biomolecules Scope, including a prompt and item-specific rubric. In this assessment, students view an image of enzyme function in a cell and describe "what the enzyme is linking with ... [and] what is happening in the diagram in relation to all the parts ... using a representative example, such as how the enzymes in a meat tenderizer are similar in function to those within each cell." A sample response is provided, and the constructed response rubric suggests the following scoring: "10: The student's response correctly identified all three points with correct labels and descriptions, showing a clear separation between each piece of information required. 5: The student's response correctly identified two of the three points outlined above and clearly separated each piece of information required."
- Materials also include information via the "STEMscopedia" activities, where the materials guide teachers to look for specific components when evaluating student responses. Each "STEMscopedia" activity contains an answer key with sample student responses. For example, in the Scope: Interactions in Body Systems, the Explain tab includes a STEMscopedia answer key

that lists “The nervous and endocrine systems interact in temperature control” and “The nervous and endocrine systems interact in thyroid metabolism” as possible answers to an open-ended question about interactions between body systems.

- Another example of where the materials include information and/or resources that guide evaluating student responses can be found in the Explore section. For example, in Scope: Evidence for Evolution, the Explore tab includes an activity titled “Evidence of Evolution,” where the answer key facilitates guidance for evaluating the student responses to the Claim-Evidence-Reasoning (CER) by providing a grading rubric for students to follow and teachers to utilize to grade responses from either 2, 1 or 0 points.
- Materials include information and/or resources that provide guidance for specific components when evaluating student responses. For example, in the Scope: Results of Evolution, under the Evaluate tab, two student assessments are provided, a Claim-Evidence-Reasoning and a Scope Assessment. Both assessments include an answer key with justification for correct and incorrect answers. Rubrics are also provided for the constructed written response questions. These answer keys provide clarity and help address content misconceptions to aid in planning for future lessons.

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.

- The 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. This is evident in the “Progress Monitoring & Reflection” section of each Scope, which includes a log for students to track their assessment data. For example, in the Homeostasis Scope, students self-assess their understanding of the “scope’s fundamental ideas before any formal introduction to the topic” and at various checkpoints throughout the scope. Students also “track their data on TEKS mastery following the same checkpoints, and ... create bar graphs to better visualize the data.” Students indicate their level of understanding using color-coded responses where “Green indicates a student is confident in their understanding, yellow indicates a student is somewhat confident in their understanding, and red indicates a student is not confident in their understanding.” The materials guide teachers in responding to this data, e.g., “If students ranked their understanding high before a checkpoint but did not score well on the checkpoint, they may need misconceptions clarified during the Explore and Explain sections.” This supplemental activity supports teachers’ analysis of assessment data and helps guide teachers’ responses to individual student needs based on their results.
- The materials also provide guidance documents and resources via the “Claim-Evidence-Reasoning” activities. For example, in the Scope: Mechanisms of Natural Selection, the Claim-Evidence-Reasoning activity, which can be found in the Evaluate section, includes teacher guidance for students that are struggling with the activity. The materials suggest that if students struggle with the CER, they “can work with the teacher in small groups using the elements in the Intervention section before moving to the Scope Assessment.”

Accelerate Learning STEMscopes Biology Texas

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

- The materials provide assessment tools for student reflection that yields information teachers can use when planning instruction, intervention, and extension. Each scope contains a “Progress Monitoring & Reflection” section, which includes a log for students to track their assessment data. Students color code their logs green, yellow, or red according to their proficiency for each “I can” statement. Once students complete their logs, these assessment tools allow teachers to identify areas of concern, plan for remediation, or plan for extension. For example, in Scope: Genetics and Inheritance, the Engage portion of the lesson has a “Progress Monitoring and Reflection” section for students to monitor their progress as they proceed through the scope. For this scope, teachers are given support to instruct students on monitoring their performance before beginning the scope, during the scope, and after the scope assessment. The monitoring log helps to guide students toward mastery of the content.
- The Progress Monitoring and Reflection Logs also include self-reflection questions for students to use after analyzing and interpreting data. These logs are within the Scope Assessment Answer Keys, which shows TEKS alignment broken down by questions. For example, in the Scope: Ecological Relationships, the Scope Assessment Key has a chart on the first page showing every question by number, the item type, TEKS (standard), DOK level, whether or not it contains a stimulus, and whether or not the question is auto-graded.
- The materials provide assessment tools for student reflection, these materials are intended for student reflection though a teacher could use this tool for planning instruction, intervention, and extension for an entire class.

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 use when responding to student performance data. For example, for students who display mastery, a “STEM Choice Board” includes a variety of projects for students to complete to deepen their understanding of course content. For example, in the Scope: Interactions in Body Systems, the Acceleration tab includes a “STEM Choice Board” activity that provides research projects on scientists, careers, recent news articles, and scientific journal articles for students to complete. A second example of the “STEM Choice Board” is found in the Scope: Changing Biodiversity. This choice board helps leverage and accelerate student learning for students who need to be pushed beyond the scope of the standards (TEKS) language and assessment level.
- Furthermore, the materials include an Intervention section within the scope that provides teacher guidance on leveraging different activities to facilitate students who need additional support. For example, in the Scope: Evidence for Evolution, the Intervention tab includes a Small-Group Intervention resource that provides a guided practice where students match descriptions of the types of evolution with their corresponding evidence. Next, students answer a set of questions using the table they have just completed. A final support for the materials provided within the Intervention tab is a game where students actively practice science concepts.
- A second example of the Intervention tab can be found in the Scope: Changing Biodiversity, where the materials provide teachers with the option for a “Guided Practice, [where] students will review changing biodiversity through a small-group activity led by the classroom teacher.”

Accelerate Learning STEMscopes Biology Texas

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 which are scientifically accurate, avoid bias, and are free from errors. The materials include assessment tools that 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 scientifically accurate items, avoid bias, and are error-free. Each Scope includes a summative assessment under the Evaluate section. These assessments include items that present content and examples fairly and impartially without impacting student performance based on such factors as a student's home language, place of origin, gender, or race and ethnicity. This can be seen in the scope: Result of Evolution; under the Evaluate tab, a "Scope Assessment" can be found that contains questions such as "What type of evolutionary mechanism occurs if one ladybug migrates to a new area and interbreeds with a new population of ladybugs?" with an image showing gene flow between two populations of ladybugs.
- Assessments also contain items that are scientifically accurate. For example, in the Biomolecules "Scope Assessment," students respond to the following question: "Which biomolecules store energy and provide structural support in plants?" The answer key identifies "B. Carbohydrates" as the accurate response. Another example can be found in the DNA Technology Scope's "Scope Assessment," which includes questions such as, "Which statement describes the importance of a polymerase chain reaction (PCR)?" and the answer, "It is used to amplify specific regions of DNA for further analysis." This question and answer is an example of accuracy.
- Additionally, assessments are also free from errors. For example, in the Cellular Respiration and Photosynthesis Scope, in the Evaluate section, there is a "Scope Assessment," which is aligned with learning goals and does not contain any errors.

Accelerate Learning STEMscopes Biology Texas

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

- Assessments contain pictures and graphics that are developmentally appropriate. For example, in the Scope: Plant Structures, under the Evaluate section, the “Scope Assessment” contains a picture of a flower growing upright toward a light source directly above it compared to a flower bending towards a light source beside it. These images are developmentally appropriate for high school students. Another example of the use of developmentally appropriate pictures and graphics can be seen in the Ecological Relationships Scope, within the Scope Assessment, where the question, “What organism in the food web diagram would have the most impact on the ecosystem’s stability if it were affected by disease and its population decreased?," is asked alongside an image of a Texas Prairie food web. This provides context for students and is developmentally appropriate for high school students.
- Clear pictures and graphics are evident in the “Cell Cycle and Specialization” and the “Meiosis and Reproduction” Scopes. Each of these Scopes contains drawings that clearly depict the stages of mitosis and meiosis, which allow students to clearly see what occurs in each stage. They are also evident in the Elaborate section of the Meiosis and Reproduction Scope within the Reading Science activity. This activity includes pictures of human chromosomes in a clear, concise manner.

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. This guidance is evident in reminders that provide suggestions on the appropriate amount of time students should be able to complete an assessment. Each “Scope Assessment” contains a “Preparation” section that details instructions for how teachers can prepare to administer the assessment. For example, in the Biomolecules “Scope Assessment,” the “Preparation” section directions suggest that the teacher “If not assigning [the assessment] digitally, print one Scope Assessment for each student” and “Write the start and finish times on the board...Inform the students that they have a certain amount of time to complete the Scope Assessment."
- Another example of guidance the materials provide teachers can be seen in the provided rubrics. For example, in Scope, Meiosis, and Reproduction, within the Evaluate section, a Claim-Evidence-Reasoning assessment is provided along with a rubric for scoring. The rubric contains possible student answers along with scores ranging from 2, 1, or 0. The material provides teachers with detailed information on assessment tools and their scoring procedures.
- The materials also provide answer keys to ensure consistent and accurate administration of assessment tools. For example, in the scope: Ecological Relationships, under the evaluate tab, the “Scope Assessment” includes a detailed answer key that provides teacher guidance on TEKS alignment, item type, DOK level, and question feedback on the right answer and why incorrect answers are incorrect.

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

- Materials offer accommodations for assessment tools so students of all abilities can demonstrate mastery of learning goals by including differentiation strategies alongside assessments. For example, in the Plant Structures Scope, under the Evaluate section, the “Scope Assessment” contains a “Differentiation” section which recommends that teachers “Provide a

visual reminder of test-taking tips for the student to refer to during the test. Note or announce the time remaining. If necessary, prompt the student to skip a question or section and return to answer it before time runs out." The Differentiation section also includes directions for tiered intervention strategies. For example, in the Biomolecules Scope Assessment, the accompanying Differentiation section, Tier 1 Interventions, suggests the teacher "Provide a visual reminder of test-taking tips for the student to refer to during the test. Note or announce the time remaining. If necessary, prompt the student to skip a question or section and return to answer it before time runs out." This guidance helps students of all abilities demonstrate mastery of learning goals.

- Guidance for accommodations is also evident in the ability of teachers to provide online or paper-based assessments. For example, in Scope: Genetics and Inheritance, the Evaluate section includes a "Scope Assessment" that can be assigned digitally or printed for each student.

Accelerate Learning STEMscopes Biology Texas

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

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

The 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.

- The materials provide recommended targeted instruction and activities to scaffold learning for students who have not mastered. This recommended targeted instruction can be found in the "Intervention" tab within each scope. The "Intervention" tab provides clarity on what students must master and scaffolds activities for students to achieve that level of mastery. For example, in the "Homeostasis" Scope, the "Intervention" tab explains that students "must understand passive transport allows molecules to move down a concentration gradient without the expenditure of energy." This section also recommends targeted instruction for students who have not achieved mastery. This activity is where students review homeostasis in a small group activity game led by the teacher. In the game "Don't Say That!," one student is a talker while the other is a guesser. The talker aims to get their partner to guess the key term at the top of each card. The talker can use any vocabulary except the words listed below, the key term on the card.
- The materials also recommend activities to scaffold learning for students who have not yet achieved mastery. This is evidenced by the instruction format in a 5E+IA (Intervention and Acceleration) model. For example, each lesson includes recommendations for downward scaffolds to support students in successful science learning and knowledge building. Recommended scaffolds vary depending on the area of focus but can include small-group interventions that include guided and active practice activities with embedded tier 1, tier 2, and tier 3 intervention strategies. This is evident in the "Interactions in Body Systems" Scope, which contains a small-group intervention activity where students review systems' interactions by playing an "Act It Out" game to practice concepts and vocabulary. Intervention activities such as

these provide targeted instruction that scaffolds learning for students who have not yet achieved mastery. This "Act It Out" game can also be found in the "Meiosis and Reproduction" Scope, along with another "Small-Group Intervention" activity where students match terms with definitions on a concept map. Furthermore, the scope "Ecological Relationships" in the Interventions tab includes a "Small-Group Intervention" where ."..students will review ecological relationships through a small-group activity led by the classroom teacher. Then in the Active Practice, students will play the "Don't Say That!" game to practice scope concepts and vocabulary."

Materials provide enrichment activities for all levels of learners.

- Materials provide enrichment activities for all levels of learners. This is evident in each Scope's "Science Beyond the Classroom" resource tab. This resource explains what students are doing in class and includes supporting information and activity options that can be completed at home in various ways. The resource also includes background information, term definitions, and suggestions for working together so families can support their students in various ways. For example, in the "Cell Cycle and Specialization" Scope, the "Science Beyond the Classroom" resource suggests that students model the cell cycle phases using common material. It also provides clear directions: "Take a piece of string and loosely tie a rubber band around the middle. You have made a piece of DNA called a chromosome with its centromere in the center. Repeat this once." In these ways, the materials provide instructions for enriching all learners' understanding of the cell cycle.
- These enrichment activities are also evident in the material's 5E+IA model. This model provides differentiated activities to benefit all students. The activities are within each Scope in the "Acceleration" tab. This tab includes a "Science Art" activity which allows students to illustrate the scientific concepts they learn through art. For example, the "DNA" Scope, the "Science Art" activity challenges students to create a DNA timeline to illustrate the history of DNA. This activity incorporates different learning targets into one engaging activity in which students create their graphic organizer. These kinds of activities provide enrichment for all levels of learners.
- Another example of where enrichment activities can be found is in the "Elaborate" section of each Scope. For example, in the "Genetics and Inheritance" Scope, the "Elaborate" tab has a section titled "Engineering Connection," which includes an enrichment activity in which students design a Punnett square to explain how sex-linked traits are inherited. The "Elaborate" tab also includes several other enrichment activities, such as Science Connection, Technology Connection, Math Connection, Science Today, Reading Science, Writing Science, and Virtual Experience. In this variance of activities, all learners' needs are supported.
- Furthermore, the materials provide enrichment activities through hands-on labs and project-based explorations. This can be seen in Scope "Carbon and Nitrogen Cycles," in the "Explore: Disruptions to the Carbon and Nitrogen Cycle" activity, where students "use cards to show the causes and effects of disruptions to both the carbon and nitrogen cycles, including the effects on ecosystem stability." Another example is also seen in the "Acceleration: Science Art" activity, where students "create a drawing that illustrates how the carbon and nitrogen cycles are important to an ecosystem's stability."

Accelerate Learning STEMscopes Biology Texas

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

- The material guides just-in-time learning acceleration for all students. This is evident in the "Acceleration" tab of each Scope. This tab includes two resources for teachers: one, the "STEM Choice Board" and two, the "Science Art" activity. The choice board includes different approaches students can take to apply the topics they have learned within the Scope and provides new and relevant methods that connect students' learning to the world around them. For example, in the Scope "Evidence for Evolution" in the "Acceleration" tab, teachers can find the "STEM Choice Board" where activities such as: Scientist Spotlight," "Career Connection," "Act Locally," and "Diversity in Science" can be found. Also, within the "Acceleration," a "Science Art" section can be found. In the same Scope, "Evidence for Evolution," the "Science Art" activity instructs teachers to have students create cladogram drawings to illustrate the evolutionary relationships among the phyla in the kingdom of Animalia. These activities are readily available for students to explore further into the content to advance their knowledge base.
- The materials also provide scaffolds and guidance for just-in-time learning acceleration for all students within the "Explore" tab. For example, in the Scope "Changing Biodiversity," under the "Explore: Changing Biodiversity" tab, there is a "Think-Pair-Share" activity that includes questions the teacher can ask to support students when it becomes evident that they are struggling to maintain engagement during the task. Another example can be found in the scope "Changing Biodiversity" under the "Explore: Changing Biodiversity" tab, where suggested statements and answers are provided for the teacher to use during the shared portion of the activity. For example, the teacher's statement, "Name a human activity that causes air pollution." is provided with an example student response, "Burning fossil fuels, such as coal, oil, and gas, and exhaust from automobiles cause air pollution." Another example can be found in the "DNA" Scope in the "Explore" tab. Here an activity titled "Edible DNA" can be found, which provides teacher guidance for whole-class instruction where teachers ask students, "What are the four nitrogenous bases that make DNA?" and "What are the complementary base pairs?." The material also provides sample student responses to these questions.

Accelerate Learning STEMscopes Biology Texas

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. Evidence can be found within the materials 5E model and in the" Explain," "Explore," and "Elaborate" tabs.
- Materials provide activities formatted in the 5E instructional model that includes a variety of instructional approaches for teachers to choose from to best engage students. For example, the Cellular Respiration Scope contains eight different "Elaborate" activities that teachers can select for their students or allow student choice. These activities include connections to science, technology, engineering, math, reading, and writing. By providing teachers and students with a variety of developmentally appropriate instructional approaches, materials engage students in the mastery of the content.
- In the "Diseases" Scope, in the "Explain" tab, a "STEMScopedia" document can be found. This document is written in developmentally appropriate language and the context of developmentally appropriate issues. For example, in the STEMScopedia, students "read and comprehend grade-appropriate complex text about diseases caused by viruses, bacteria, and

cell mutations such as cancer." In the concluding "Connection," students are advised to monitor symptoms during illness and seek appropriate medical care.

- The material also engages students in mastering the continent through activities in the "Explore" section. For example, in Scope "DNA Technology," the "Explore" has an acidity titled "Explore: DNA Manipulation Research." In this activity, students research DNA Technology and present the findings to the class. Another activity includes a Virtual Explore in which students explore different types of technology that can manipulate DNA and some of the possible benefits of the technologies.
- Furthermore, the "Science Art" activities in the "Elaborate" tab provide developmentally appropriate instruction. For example, in the Scope "Results of Evolution," the "Acceleration" tab has a "Science Art" activity where "Students… choreograph dances that illustrate how a new behavior or trait can evolve in a population due to gene flow." Students and teachers are provided with a rubric to allow for model revision when necessary.

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

- Materials consistently support flexible grouping through the activities provided. These activities provide flexibility in how student work time is structured. For example, in the "DNA" Scope, under the "Explore" tab, teachers are given three different activities with different student group structures. In the first activity, "Edible DNA," students construct models of the DNA double helix using candy; this can be completed individually, in partners, or in small groups. In another activity, "Virtual Explore: DNA," students navigate through informational task cards; this can be completed individually or in partners or groups. Materials consistently support flexible grouping of students by providing a variety of activities that aren't rigid in student grouping structure.
- Furthermore, in the "Biomolecules" Scope, teachers engage all students in a gallery discussion about biomolecules and their essential roles in living organisms. During the "Explain" phase, students take individual notes in their interactive science notebooks. While in the "Elaborate" phase, students work in small groups to "determine a more efficient crop for biofuel production than corn based on analyses of biomolecules present in corn and other crops."
- Another example can be seen in the "Genetics and Inheritance" Scope, under the "Explore" tab in the "Designer Aliens" activity where the teacher divides the "class into groups of two" and has students identify the genotypes of parent aliens and then determine the possible allele combinations of potential offspring.
- Flexible grouping is also evident in the Scope "Results of Evolution" in the "Elaborate" tab. Here a "Science Connection" activity provides teacher guidance to "Allow students to work in small groups" as they "present persuasive speeches about whether GMOs are safe."

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 numerous types of activities provided in the 5E instructional design model. For example, during the "Explore" phase of the "Homeostasis" Scope, the activities model collaborative and independent practice. First, the teacher lines up the chairs to model diffusion, facilitated diffusion, and active transport. Students then collaboratively model the movement of materials across a membrane using a decalcified egg as a model. Finally, students work

independently to write definitions of new terms. Furthermore, in the "Plant Structures" Scope, under the "Elaborate" tab, teachers are provided two different activities for students. In the first activity, "Plant Investigation Stations," students rotate around the room, investigating different features of plant structures at each stop. Then in the activity "Virtual Explore: Plant Structures," students navigate through informational task cards regarding the features of plant structures. Through these two practice activities, the needs of students are met.

- Another example where the material provides multiple types of practice and guidance can be found in the Scope "Evidence for Evolution" in the Explore tab. Here an activity titled "Evidence of Evolution" has students travel to six stations to study the different types of evidence of common ancestry and answer questions. The activity then utilizes a Think, Pair, Share strategy where students share their answers to the questions, and students build on each other's thoughts.
- Finally, the material provides activities with explicit teaching, followed by opportunities for students to work independently in lab investigations. This can be seen in the Scope "Ecological Relationships," where students are engaged with a real-world phenomenon about an African food web, followed by a class discussion where the teacher emphasizes "... the importance of models such as this one that shows the movement of energy through several food chains.[and then] Explain[s] to them that disruptions to food chains can affect the stability of an ecosystem." The lesson then continues with an activity titled "Explore: Cycling of Matter and Flow of Energy Through Trophic Levels," where students rotate stations. "At each station, students will read and study either food webs or energy pyramids and answer questions related to the activity."

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

- Materials represent a diversity of communities in the images about people and places within the STEMscopedia and STEM Choice Board sections. For example, in the "Homeostasis" Scope, the Explain tab has a section titled "STEMScopedia," where an image of runners can be seen. This image includes "People of Color" running on an urban bridge. Also, the "STEMscopedia" of most Scopes includes the work of relevant scientists who belong to a variety of racial communities. For example, in the "DNA" Scope under the "Explain" tab, the "STEMscopedia" includes information about the scientific contributions of Rosalind Franklin and Leslie Orgel. Furthermore, in the "Genetics and Inheritance" Scope, the "STEMscopedia" includes a reading where students answer questions about Mendelian Genetics and Inheritance. This reading includes an image of a family composed of multiple races. Additionally, in the Scope "Changing Biodiversity," a STEM Choice Board can be found under the 'Acceleration" tab. The choice board offers an activity titled "Scientist Spotlight**:** Dr. Wangari Maathai," where students "Search out several news articles or research papers that involve Wangari Maathai's work. By including such information, materials represent a diversity of communities in their information about people.

Accelerate Learning STEMscopes Biology Texas

Indicator 7.3

Materials include listening, speaking, reading, and writing support 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 support 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 materials include suggestions for linguistic accommodations at critical points in the main lesson, particularly for students at the beginning and intermediate levels, such as peer grouping strategies, sample questions, and discussion starters for students with various English language proficiency levels. These suggestions can be found in the Resources Tab in the English Language Support Strategies. These strategies suggest the teacher use a variety of general language acquisition supports, e.g., Always, Sometimes, Never picture cards and thumbs up for good examples and thumbs down for bad examples that students choose to respond to various prompts. Also, within the scope: Evidence of Evolution, Explore, English Language Support Strategies, in which teaching strategies for teachers to "Encourage Creating Analogies to help students process new learning. After explaining new content, the teacher provides students time to create their comparisons in their ISNs. Use the provided stems to finish an analogy." for EBss with a beginner Proficiency Level.
- Additionally, guidance for linguistic accommodations can also be seen in the Cellular Respiration and Photosynthesis Scope, in the Explore section, within the" Modeling Photosynthesis and Cellular Respiration" activity. This activity guides teachers by instructing them to "Utilize Total Response Signals to informally assess students' current levels of understanding" to support students who are beginning to become proficient in the English language.
- Further guidance can be found in each scope's "English Language Proficiency Standards". For example, the Standards Planning section in Scope: DNA Technology includes the English Language Proficiency Standards (ELPS) for the specific scope. For example, the ELPS includes c1C

using strategic learning techniques such as concept mapping, drawing, memorizing, comparing, contrasting, and reviewing to acquire basic and grade-level vocabulary.

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

- The material encourages the general use of students' first language as a means of linguistic, affective, cognitive, and academic development in English. The materials include teacher guidance for differentiation that includes Proficiency Levels, such as "Allow beginning students to write in any way they feel comfortable, even if that means writing in their native language. Encourage them to use any English words they are comfortable with". This is evident in the Scope: DNA Technology, in the Elaborate section under Writing Science.
- While activities encourage the use of students' first language, such use of language is not strategically implemented, only providing some guidance to teachers.. For example, "Allow students at a beginning level to question and respond in their native language. Then, repeat the activity by translating their conversation into English. Proofread the English translation, and give students feedback on improving formal and informal or expert and novice English."

Accelerate Learning STEMscopes Biology Texas

Indicator 7.4

Materials provide guidance on fostering connections between home and school.

1	Materials provide information to be shared with students and caregivers about the design of the program.	M
2	Materials provide information to be shared with caregivers for how they can help reinforce student learning and development.	M
3	Materials include information to guide teacher communications with caregivers.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials provide guidance on fostering connections between home and school.

Materials provide information to be shared with students and caregivers about the design of the program. Materials provide information to be shared with caregivers for how they can help reinforce student learning and development. Materials include information to guide teacher communications with caregivers.

Evidence includes but is not limited to:

Materials provide information to be shared with students and caregivers about the design of the program.

- Materials provide information to be shared with students and caregivers about the design of the program. This is evident in the materials because each scope includes a “Science Outside the Classroom” file which explains the concepts that students are studying. This file includes TEKS, background knowledge, and information about how students learn within the scope. For example, in the Biomolecules Scope, the Science Outside the Classroom file states that students will do many “explorations in class to... learn these concepts from firsthand experiences.”
- The materials also provide a STEMscopes Pedagogy document which outlines the design and structure of the STEMscopes curriculum, explaining to parents and students how and why the course is structured the manner it is.
- Furthermore, in the Resources section, under “Texas Resources,” a Welcome Letter can be found. This letter is intended for parents and provides an overview of the design of STEMscopes. The letter states, “STEMscopes is built on an instructional philosophy that centers on students learning science through hands-on exploration and inquiry. Each lesson includes a series of investigations and activities to bring science to life for our students so that they can learn by doing and fully engage in the scientific process." The letter “is available for download” “and can be modified for distribution to parents and guardians of STEMscopes students.”

Accelerate Learning STEMscopes Biology Texas

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. Materials provide at-home activities for caregivers to help reinforce student learning and development. For example, in the Prokaryotic and Eukaryotic Cells Scope, the Science Outside the Classroom section provides an activity for building different cells from clay and follow-up questions and answers. This activity can be completed at home, reinforcing student learning about prokaryotic and eukaryotic cells. Another Science Outside the Classroom activity is in the Scope: Changing Biodiversity. This activity, titled “Duo Diorama,” provides an opportunity for students and parents to create a diorama at home “To help students practice and learn more about Changing Biodiversity.” The activity instructions include a materials list and instructions for parents and students to produce an authentic model together. The materials include questions for parents to discuss with students and exemplar student responses to help guide the content conversations.
- Materials also provide resources and strategies for caregivers to help reinforce student learning and development by providing printable scientific texts that connect to the learning targets for that week. Each scope has a “STEMscopedia” section that can be printed for students and/or caregivers to serve as a reference for learning targets within the scope. For example, in the Gene Expression Scope, the Explain tab contains a STEMscopedia text that explains the vocabulary and context for the unit, such as how genes within DNA code for proteins and diagrams of the Central Dogma.
- Furthermore, in the Scope” Mechanisms of Natural Selection, the Acceleration tab provides students with several options of assignments that can be printed and taken home. One of these activities, titled “Historical Connection,” has students research a historical event and provides information to be shared with caregivers so that they can help reinforce student learning.

Materials include information to guide teacher communications with caregivers.

- Materials include information to guide teacher communications with caregivers. Each scope includes a Science Outside the Classroom file that explains what students are studying within the current scope. The Science Outside the Classroom pdf can be shared with caregivers and includes TEKS, background knowledge, and some information about how to learn more about student progress. The document provides information that helps caregivers reinforce student learning. Teachers can edit the document to include any additional information. For example, the Science Outside the Classroom, within the Cell Cycle and Specialization Scope, invites the reader to “Encourage students to share these experiences with you and to teach you what they have learned.” By providing such resources, materials include guidance for teacher communication with caregivers.
- The materials also guide teacher communication with caregivers through the Progress Monitoring and Reflection Log, where students can check their understanding of the TEKS. For example, in Scope: Mechanisms of Natural Selection, the Engage section of the scope includes a Progress Monitoring and Reflection Log where students can check their understanding of the TEKS. The material also provides a Progress Monitoring page in the same area where students monitor their progress through the scope. This information can then convey the student's progress to the caregiver.
- Furthermore, in the Resources section, under “Texas Resources,” a Welcome Letter can be found. This letter is intended for parents and provides an overview of the design of STEMscopes.

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The letter states, “STEMscopes is built on an instructional philosophy that centers on students learning science through hands-on exploration and inquiry. Each lesson includes a series of investigations and activities to bring science to life for our students so that they can learn by doing and fully engage in the scientific process." The letter “is available for download” “and can be modified for distribution to parents and guardians of STEMscopes students.”

Accelerate Learning STEMscopes Biology Texas

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 into 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 into 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 within the resources tab under the Planning with StemScopes tab that outlines the order in which knowledge and skills are taught and built into the course materials. For example, the Biomolecules Scope, which is aligned to TEKS B.5(A), B.11(B), should be taught before the Prokaryotic and Eukaryotic Cells Scope, aligned to TEKS B.5(B), both with suggested instructional pacing. The Standards Planning section of each scope lists the TEKS addressed in the Scope. The material includes a Suggested Scope Calendar that provides daily activities. As an example, for day 1, the teacher accesses prior knowledge and introduces the phenomenon to the students.

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 core concepts and science and engineering practices. The materials list for each scope indicates core concepts and science and engineering practices within materials. For example, in Explore, Spork Evolution, the SEP is B.2C is listed. The teacher guidance in Team Talks focuses on supporting students' sensemaking based on qualitative observations and analysis. Furthermore, the "Elaborate" section of each Scope provides several activities with SEP indicated and provides guidance on facilitating students' connections across learning by suggesting various activities for student discussion.

Accelerate Learning STEMscopes Biology Texas

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

- The material provides a review and practice of knowledge and skills spiraled throughout the year to support mastery and retention. The Engage section of each Scope provides activities to practice prior knowledge from the course. For example, in the Engage section for Gene Expression, students review and practice vocabulary regarding mutations. Each scope's homepage lists spiral opportunities for reviewing knowledge and skills. For example, in the Gene Expression Scope, the spiraled vocabulary includes "DNA" and "Genetics." Further examples include how the Cell Cycle and Specialization Scope includes reference to DNA, and how the Prokaryotic and Eukaryotic Cells Scope references lipids and nucleic acids from the Biomolecules Scope. The publisher added more connections based on initial feedback, such as concepts from the Evidence of Evolution and Mechanisms of Evolution Scopes to the "Results of Evolution" Scope.

Accelerate Learning STEMscopes Biology Texas

Indicator 8.2

Materials include classroom implementation support for teachers and administrators.

1	Materials provide teacher guidance and recommendations for the 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 the use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning. Materials include standards correlations, including cross-content standards, that explain the standards within the context of the course. Materials include a comprehensive 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 the 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 recommendation for the use of all materials. This is evidenced by the guidance provided in each scope that directs teacher use of all materials. For example, in the DNA Scope, each Explore activity has a Preparation section that outlines teacher actions and what is needed to support and enhance student learning. The specific guidance includes printing copies of the student handout, dividing the students into groups of two, and explicitly instructing how to prepare the Explore materials for the lesson. The material also provides teacher guidance by including an instructional page to navigate the site. From the Dashboard, a teacher can view the Navigation Guide, which provides pictures, text, and websites that can be used to find information on how to use the materials within the scopes.
- Furthermore, the materials provide research-based instructional strategies within the scope. The scopes are organized lesson plans written in a 5E framework. The 5E is a research-based instructional strategy that supports student learning. Building in the 5E model not only provides research-based instructional strategies but also provides scaffolds to support and enhance student learning. Each phase of the 5E is included in the description preceding the plans for that

E. For example, in the “Prokaryotic and Eukaryotic” scope, the material states that the purpose of the Engage section is to "uncover student misconceptions and provide a measure of student learning to act as a baseline."

- Scaffolds are also evident in the “Biomolecules” scope, which includes options for acceleration in the form of a STEAM Choice Board. This board is where the teacher guidance explains how to use enrichment activities to support students' application of scope topics to the world around them.

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

- Materials include standards correlations, which have cross-curricular standards, that explain the standards within the context of the course. For example, the Standards Planning section in each scope lists the TEKS that correlate to the material, including content TEKS, Scientific and Engineering Practices, ELPS, Vertical Alignment, College and Career Readiness Standards, Math TEKS, Reading Language Arts TEKS, and English Language Proficiency Standards. Furthermore, the Standards Overview in each scope reviews the TEKS that apply to the scope. In the “Changing Biodiversity” scope, teachers will see that they cover B.13D in this scope. This scope also includes cross-content standards on the Elaborate tab, which presents an ELA TEKS Connection that lists “EI.8C: evaluate the author’s use of print and graphic features to achieve specific purposes;' within the activity.
- Furthermore, in the 'Homeostasis' Scope, the 'Math TEKS Connection' identifies TEKS A1.1.D. This TEKS is once again referenced in the Elaborate section of the scope. The preceding description provided to the teacher explains it. That description clarifies that students will analyze data about glucose uptake in a scatterplot."

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

- The curriculum materials include a comprehensive list of all equipment and supplies needed to support instructional activities. A list can be found within the scope under each tab where all materials necessary to complete each part of the 5E activity are listed in the "Materials" section. The materials provided are categorized as "Activity Files," "Reusable," and "Consumable.". For example, in the “Biomolecules” scope, under Explore tab, teachers can select “Explore: Biomolecules Bingo” to find the materials needed for this lesson component, which requires 45 biomarkers, one resealable bag, and one computer with internet access as well as all the printable activity files. Scopes also include options for “Science Outside the Classroom,” where all materials needed for these activities are listed. For example, in this section of the “Cell Cycle and Specialization” scope, cell division modeling is suggested to help students practice and learn more about the cell cycle. A comprehensive list of materials, such as string or chenille stems rubber bands, and a marker, is included. Furthermore, in the scope
“Carbon and Nitrogen Cycle” under ”Explore: Disruption to the Carbon and Nitrogen Cycles” the activity contains a materials list and a drop-down menu to see the materials for the activity.

Accelerate Learning STEMscopes Biology Texas

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

- The materials include “Instructional Supports” in the “Resources” and include Lab Safety. The “Lab Safety Tab” has a pdf of a safety poster and a PowerPoint that depicts and explains ten lab safety practices that are appropriate for high school students use of equipment during investigations. Furthermore, In the “Biomolecules” scope under the Explore tab, students investigate the role of enzymes in starch digestion. The instructions include a recommendation that teachers carefully monitor students' use of knives when used to slice the starch potatoes.
- The materials also provide scaffolded guidance, an option for the teacher to pre-slice the potatoes. Lab activities include specific lab safety for each learning experience. Materials provide specific guidance regarding relevant safety procedures and guidelines applicable to each lab under the "Preparation" section in the "Explore" tab. For example, during the "Explore: Starchy Digestion" activity located in the Biomolecules scope, the materials state, "Familiarize yourself with the functions and operation of the light microscope, particularly the slide stage, lenses, focus knobs, and any other parts specific to the model of microscope. Students should wear goggles and aprons at all times during this activity." Additionally, the guidance includes, “Demonstrate safe practices with knives. Model for students how to safely carry, use the light microscope, and prepare slides. Remind students that iodine is a chemical that will stain clothes and skin and to report any accidents” and “ Remind students not to touch the hot plate and to use proper thermal gloves or beaker tongs when handling the hot beaker” to do steps 2 and 3.

Accelerate Learning STEMscopes Biology Texas

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

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. Materials provide some 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 provide some guidance on 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.

- Material supports scheduling considerations and includes guidance and recommendations on required time for lessons and activities. The curriculum is presented in a day-by-day format within each unit of study, with a total of 19 units over the course of the yearly curriculum. For example, the “Meiosis and Reproduction” Scope planned for seven days of 45-minute lessons with an additional intervention and acceleration built into the scope. The curriculum materials provide support in guidance and recommendations on required time for lesson activities. For example, each scope contains a “Suggested Scope Calendar.” The calendar contains the suggested number of days for each phase of the 5E lesson with associated accelerations and interventions. This calendar assumes a 45-minute time period. For example, in the “Meiosis and Reproduction” Scope, the 5E lesson is broken into seven days, with Engage on day 1 and Explore on days 2 and 3. Interventions and accelerations are embedded, and the schedule is easily adapted to meet other needs and alternative schedules, such as block schedules. Also, in the “DNA” Scope, the 5E lesson is broken into eight days, such as Engage on day 1, Explore and Explain on days 2-4, Explain on day 5, Elaborate on day 7, and Evaluate on day 8.

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

- The materials offer some guidance on strategic implementation while maintaining the sequence of content that must be taught in a specific order and follows a developmentally appropriate progression. For example, the lessons are designed in a 5E layout, including engage, explore,

explain, elaborate, evaluate, and interventions and supplemental acceleration strategies, but following them sequentially reveals that some units in the material require prior knowledge that has not yet been taught. The materials provide a “Suggested Scope Order,” which reveals that some units in the material require prior knowledge that has not yet been taught. For example, the Engineering Connection in the “DNA Technology” Scope asks students to create a breeding plan to produce specific traits in cattle before they receive the necessary knowledge from the “Meiosis and Sexual Reproduction” Scope and the “Genetics and Inheritance” Scope. Similarly, the “DNA” Scope requires students to "design an offspring from the given canine parent genotypes that will result in the highest chance of the desired traits being expressed," however the concepts of genotypes and heredity are taught to students during the “Genetics and Heredity” Scope.

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

- Materials provide flexible options for activities and assessments, allowing completion of the course's scope in one school year. For example, the “Meiosis and Reproduction” Scope offers four options for "Explain" activities and eight options for "Explore" activities. Furthermore, the material provides recommendations for the timeline of specific lesson completion. The location for the lesson timeline recommendation is within “Resources” under the “Lesson Planning Guide,” which houses the “Suggested Scope and Sequence.” This information provides support to the teacher to help with planning. Also, within each specific scope, there is a day-by-day pacing and activity that provides recommendations for the day's lesson. For example, the Scope “Evidence for Evolution” has a “Suggested Scope Calendar,” which breaks down the scope over eight days. The first day begins with accessing prior knowledge before continuing and building off of that knowledge. Additionally, the curriculum is written with 45-minute class periods in mind. For example, the curriculum is designed with a total of 19 units and 139 45-minute lessons with an additional 19 intervention and 19 acceleration lessons, one for each unit of study, allowing the curriculum to be completed within a year.

Accelerate Learning STEMscopes Biology Texas

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. Student materials, such as STEMScopedia text and supporting handouts, are easy to find and/or access and are appropriately designed to support student learning. Sections are marked with subheadings, content is organized logically, and ancillary student materials, such as glossaries and tools, are easy to find and/or access.
- Teacher guidance materials are appropriately designed, titles and headings are prominent and clear, and sections are clearly marked with subheadings. The materials are designed so teachers can easily locate important information for planning and implementation.

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. Text is supported by clear and authentic images that illustrate concepts. For example, materials include STEMscopedia, which has clear and authentic images and graphics that define and support students in learning new vocabulary. The Biomolecules Scope provides images in various formats, e.g., in the foods students eat and their chemical structures. Also, each Scope includes a “Picture Vocabulary” page located in the Explain portion that provides age-appropriate images that support student learning.
- Furthermore, the depictions of scientific phenomena are presented at a level that high school students can easily interpret.

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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. Downloads from the "Materials" button in each activity function correctly, without broken links or corrupted files. Furthermore, the materials do not have any incorrect answers on the answer sheets to problems and do not contain any inaccurate content materials or information.

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Indicator 9.2

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

1	Materials integrate digital technology and tools that support student learning and engagement.	Yes
2	Materials integrate digital technology in ways that support student engagement with 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. Digital technology and tools enhance student learning through such features as learning games, interactives, simulations, and online assessments. The Explore section of each Scope contains a virtual activity that includes content information, digital manipulatives, and self-assessment for students.
- One example can be seen in the Homeostasis Scope, within the Explore section, where students view ten digital simulations of various transport processes. Each animation is accompanied by a question where students “select an answer and click the “Submit Answer” button. If they are incorrect, they will try again.” The digital tool with embedded assessment and opportunities to revisit concepts and try to support student learning and engagement.
- Another example of the integration of digital technology can be found in the Explore section of the Scope: Genetic and Inheritance. This section includes an activity titled “Virtual Explore: Genetics and Inheritance,” which includes a digital simulation where students will crossbreed flowers to develop a better understanding of genetics and inheritance. This technology helps to support student learning and engagement.
- Furthermore, the digital technology integration is evident in the Scope: Changing Biodiversity, which includes an activity titled “Virtual Explore: Changing Biodiversity” that has students

research technology such as LiDAR and GPS mapping, as well as a scope assessment that can be assigned digitally.

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

- The materials integrate digital technology in ways that support student engagement with science and engineering practices and course-specific content. The materials provide opportunities for students to obtain and evaluate information using digital tools in the Explore section of each Scope within a virtual activity that includes content information, digital manipulatives, and self-assessment for students. Students obtain content information, evaluate it, and implement it to complete the self-assessment. For example, in the Cell Cycle and Specialization Scope, the Elaborate section contains a “Virtual Explore” activity where students “complete a guided inquiry using virtual 3-D renderings of mitosis.” Students “continue to explore the 3-D renderings on their own, noting observations and any outstanding questions.” Students use the digital 3-renderings to obtain, evaluate, and communicate information about cell division. Another example is found in the Scope: Genetics and Inheritance, where in the Elaborate section, teachers can find an “Engineering Connection” that includes resources that support student engagement utilizing technology. In this example, the activity directs students to go to the website, https://www.360cities.net/image/inside-hemoglobin, to help students develop a Punnett square and explain how hemophilia, a sex-linked condition, is inherited.
- Furthermore, in the Scope: Changing Biodiversity, the Elaborate activity “Science Connection” has students create a Public Service Announcement to educate people about invasive species. This activity contains an “Engineering Connection” that has student research and creates a model that can be used to track changes to the biodiversity of an ecosystem as a result of an oil spill.

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

- The materials integrate digital technology that supports student-to-student and teacher-to-student collaboration. This collaboration is evident in the Explore section of each Scope. This section contains a virtual activity that includes content information, digital manipulatives, and self-assessment for students. This can be completed individually, in pairs, in small groups, or as a whole class, allowing students to collaborate. For example, in the Biomolecules Scope, there is a Virtual Explore within Explore section that provides teacher guidance suggesting students can work in groups or individually to "examine the structures of different biomolecules that are related to the function of a cell." Students select which biomolecule they want to learn more about and then follow the prompts within the digital tool to observe images of and answer questions about the molecule. For instance, students can click and drag monosaccharides to build a polysaccharide. Teachers and students then "debrief students using this questioning strategy: Red Light, Yellow Light, Green Light." Thus, the materials integrate digital technology and accompanying teacher guidance to support student-to-student and teacher-to-student collaboration. Another example can be seen in the Carbon and Nitrogen Cycles Scope, where the Virtual Explore activity has students work collaboratively in pairs to "review the carbon and nitrogen cycles and how disruptions can affect an ecosystem's stability. " in a virtual classroom setting.

- The integration of digital technology collaboration in the Explore: Scientific Explanations activities. For example, in the Scope: Evidence for Evolution, the Explore: Scientific Explanations activity instructs students to work in groups of two to create a brochure on gradualism or punctuated equilibrium, and, as students use technology to research and create their brochure, they collaborate using Think-Pair-Share to discuss questions about the activity.

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

- The materials integrate digital technology that is compatible with a variety of learning management systems. Digital materials are accessible and compatible with multiple operating systems and devices. The materials are accessible and compatible with Chromebooks, iPads, PCs, Apple computers, and/or smartphones. For example, the materials provide single-sign-on ability via Clever, MS SAML, Google SSO, LTI SSO, ClassLink, and Schoology. The materials also state, “We support integration with client LMS systems through IMS Global’s Thin Common Cartridge (ThinCC) protocol.”

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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.

Materials provide digital technology and online components that 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.

- The digital technology and online components are developmentally appropriate for the course. Virtual interactives, such as videos, simulations, and other software, are at a difficulty level accessible to high school students. Each Scope contains an online interactive where students read information and manipulate virtual diagrams. For example, in the Explore section of the Gene Expression Scope, a Virtual Explore activity has students read about transcription and translation, then students utilize the information they have just gained to “drag-and-drop” RNA sequences to spaces that match the DNA sequences provided. This type of independent activity is developmentally appropriate for high school students. Another example of developmentally appropriate online components can be found in the Results of Evolution Scope, in the Virtual Explore activity, where students are given different populations of mice and discover how different factors contribute to the evolution of a population.
- Furthermore, digital technology and online components align with the scope and approach to science knowledge and skills progression. For example, in the Scope: Evidence for Evolution, the Standards Planning provides a scope alignment to the science TEKS. The TEKS are broken down into different categories within the Standards Planning document: Content area, Scientific and Engineering Practices, and Recurring Themes and Concepts area. The materials also include a digital planning guide with live hyperlinks to the other online resources to facilitate planning and ease of use. For example, in the Biomolecules Scope, within the Explore section, students use an

interactive digital tool to “examine the structures of different biomolecules that are related to the function of a cell.” The tool is available via a live hyperlink.

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

- The materials provide teacher guidance for using embedded technology to support and enhance student learning. For example, in the Prokaryotic and Eukaryotic Cells Scope, in the Explore section of the lesson, students use an embedded interactive digital technology to “compare and contrast prokaryotic and eukaryotic cells using a Venn diagram.” The materials provide detailed guidance suggesting the teacher “have students read the opening text in the brown box and then click the “Start” button. Tell students to drag and drop the characteristics of prokaryotic and eukaryotic cells into the correct areas of the Venn diagram. If they put a characteristic in the wrong section, it will return to the top, and they can put it elsewhere.” These clear instructions within the teacher materials provide support for teachers to successfully integrate the technology within the program
- Another way the materials provide support for teachers to successfully integrate the technology embedded within the program can be found in the “preparation” section of activities with embedded technology provides guidance for teachers to direct and assist students’ use of technology. For example, in the Gene Expression Scope, under the Explore section, the “Virtual Explore” activity explains that students will need a device and, if necessary, the activity can be done in a large group via the classroom projector.

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

- The materials include resources for parents and caregivers on supporting student engagement with digital technology and online components. Materials provide a letter with tips for families on supporting appropriate student engagement with digital and online components. This letter can be found in the Resources tab and includes the following information, "Your student will receive login credentials to access the program, which features some always-available resources that can be browsed at home, including a Glossary and a reference resource called STEMscopedia." This information regarding login credentials and available resources helps caregivers support student engagement with online components. The letter also "briefly describes the curriculum philosophy along with some of its features and can be modified for distribution to parents and guardians of STEMscopes students."
- The materials also provide a "Science Outside the Classroom" document with tips for families on supporting appropriate student engagement with digital and online components. This online document includes an overview of important concepts, terms to know, and a basic activity students can do at home with caregivers. For example, in the Scope: Mechanisms of Natural Selection, the Science Outside the Classroom activity includes a letter that can be sent home that reviews the scope students are learning. The letter also includes additional activities families can conduct with their students to help support their learning.