Summit K12 Dynamic Biology

Summit K12 Dynamic Biology Executive Summary

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

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

Section 2. Instructional Anchor

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

Section 3. Knowledge Coherence

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

Section 4. Productive Struggle

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

Section 5. Evidence-Based Reasoning and Communicating

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

Section 6. Progress Monitoring

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

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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 implementation guidance to meet variability in program design and scheduling.

Section 9. Design Features

- The visual design of materials is mostly 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 to 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.

The materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of appropriate scientific and engineering practices as outlined in the TEKS. Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level or course as outlined in the TEKS. Materials include sufficient opportunities, as outlined in the TEKS, for students to ask questions and plan and conduct classroom, laboratory, and field investigations and to engage in problem-solving to develop an understanding of science concepts.

Evidence includes but is not limited to:

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

- The materials provide multiple opportunities for students to develop and practice science and engineering practices (SEPs). For example, the "Science and Engineering Practices" document, located in the "Dynamic Biology Teacher's Guide" found in "Teacher Resources," states that, "The course also includes a dedicated section where teachers can access SEPs specific lessons, practice, and activities that cross all TEKS lessons." Teachers can scaffold and unlock these resources to build or strengthen student knowledge through Texas Essential Knowledge and Skills (TEKS) for the SEPs.
- Each lesson provides multiple opportunities for students to develop, practice and show mastery of appropriate SEPs. The "Science and Engineering Practices" document states, "The SEPs are embedded within every Dynamic Science Lesson and articulated in the TEKS Lesson Guides." For example, the "Biomolecule Lesson Guide," located in Category 1, provides a view into the multiple opportunities to develop, practice, and show mastery of grade-level appropriate mastery of the SEPs. Specifically, in the biomolecules lesson series, four activities include SEPs, two of which are investigations. Another example is in the Unit B.7A DNA Lesson Guide located in Category 2. The lesson includes a "Building a DNA Model" activity that provides opportunities for students to develop, practice, and demonstrate mastery for SEPS B.1G, B.2A, and B.4A.

- In addition, lessons contain “Interactives” that provide multiple opportunities for students to develop, practice, and demonstrate mastery of grade-level appropriate SEPs as outlined in the TEKS. For example, Unit B.7B in Category 2 contains an activity called “Interactive-Transcription and Translation” that gives further opportunities for students to develop, practice, and demonstrate mastery for SEP B.1G by allowing students to develop a model of protein synthesis and use the model to analyze the steps of protein synthesis.
- Furthermore, lessons contain “Key Concepts” in the lesson guides that provide multiple opportunities for students to develop, practice, and demonstrate mastery of SEPs. For example, the “Unit B.7C Key Concepts” provides multiple opportunities to practice, develop, and demonstrate mastery of SEP B.2B. Both the “Mutations Strip Lab” and “Mutations Practice” require students to analyze data by identifying features or patterns.
- The materials provide a crosswalk outlining how the students use SEPs and TEKS to investigate grade-level appropriate content concepts. All SEPs are incorporated for each grade level at multiple entry points in the content. Students engage with scientific and engineering practices multiple times and in multiple contexts. For example, the “Biology TEKS-SEPS-RTCs Crosswalk,” located in the Dynamic Biology Teacher’s Guide, shows that the students have 15 opportunities to practice SEPs B.1A throughout the course.

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.

- The materials strategically develop students' content knowledge and skills as appropriate for the concept and grade level as outlined in the TEKS. Materials include lesson guides that show how course-level content knowledge and skills are taught using SEPs and recurring themes. For example, the “Unit B.7A DNA Lesson Guide” located in Category 2 references the recurring theme of “models” as students construct models of DNA. Additionally, the Unit B.7A DNA Lesson Guide references SEPs that are included in each lesson activity to strategically develop students' content knowledge and skills regarding DNA structure.
- In addition, investigations strategically develop student knowledge and skills. For example, in Unit B.5C, students perform a lab for semipermeable membranes. Students are asked to develop explanations supported by data and models in B.3A. Later, in Unit B.6B, students are asked to develop explanations of cell differentiation models with their advantages and limitations.
- The materials support teachers in developing student content concepts and skills by giving them resources and cues at varying points in lessons throughout the grade level. For example, the “Unit B.5B Prokaryotic and Eukaryotic Lesson Guide” located in Category 1 is organized in a 5E lesson model throughout the learning process. Teachers start with Engage, where they guide students through images of molecules and cells and then ask students, “What cell types am I made of?” The lesson continues to guide the teacher, offers multiple interactives, called Apply and Extend, and finishes with Evaluate. This same lesson format is systemically used throughout the lesson guides to support student learning and guide teachers through the development of concepts and skills.
- Furthermore, the materials provide a “Biology TEKS-SEPS-RTCs Crosswalk” located in the “Dynamic Biology Teacher's Guide,” which lists SEPs and designates the number of opportunities throughout the course for specific SEPs to practice. The chart helps teachers track the use of development and skills across the course. These skills are embedded within the lessons and units of content instruction with increased complexity over time. For example, “SEPs B1.G - Develop and use models” is available for practice 15 times.

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

- The lesson guides include sufficient opportunities, as outlined in the TEKS, for students to ask questions and problem-solve. For example, during “Investigation-Modeling Cell Differentiation” located in the “Unit B6.B Cell Differentiation Lesson Guide,” students are asked to “identify three questions you have about the model....” In a separate activity from the lesson guide, students are asked to use Claim Evidence Reasoning to problem-solve the “effects of environmental stimuli on the animal.”
- Additionally, in the B.5A Biomolecules, activity “Mystery Biomolecules,” Part 1 serves as a scaffold to prepare students for Part 2, in which students plan and carry out a procedure to identify biomolecules in an unknown solution. For example, the materials guide students to use “the information from part 1 of the investigation, determine which biomolecules are present in your mystery solution.”
- Materials include “Investigations” that provide some opportunities for planning and conducting classroom, laboratory, and field investigations. For example, the “Investigation-Describing Reduction Division” located in Unit B.8A: Meiosis and Sexual Reproduction Lesson Guide” provides students with a guiding question as they are tasked with developing a procedure to build a model of the chromosomes at each stage of meiosis. After the procedure planning, students must use their procedure to build and analyze their model.
- Using the “Biology TEKS-SEPs -RTC Crosswalk” located in the “Dynamic Biology Teacher's Guide” to find materials for SEPs B.1B located in Category 1, the resources did not include students planning and conducting an investigation. However, it does allow them to implement investigations. For example, “Investigation-The Mystery Biomolecules” in “Unit B.5A Biomolecules Lesson Guide” and “Investigation-Potato Osmosis” located in “Unit B.5C Homeostasis and Cellular Transport Lesson Guide” have students completing a procedural lab.

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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 for the teacher the scientific concepts and goals behind each phenomenon and engineering problem.	M

Meets| Score 4/4

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

Evidence includes but is not limited to:

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

- The materials include phenomena that connect to real-world scenarios within lessons. For example, the "Disruptions of the Cell Cycle Lesson Guide," in Reporting Category 1 of the teacher resources, embed phenomena throughout the lesson. Within the lesson, students are prompted, "What is cancer?" and "Why do you think that regular cancer screenings are essential? Students have multiple opportunities to examine phenomena, including "The Costs of Cancer-Treating Drugs," "Oh NO!! I have moles. Are they cancerous?" and "Curing Cancer."
- Materials include "Engage" sections in each lesson guide that 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). For example, the "Unit B.7D Molecular Technologies Lesson" contains the Engage phenomena "Crime Scene Classroom," in which students use evidence to solve the problem of who vandalized a fictional classroom. This activity allows students to use prior knowledge to engage in a lesson.
- In addition, materials include "Establish Relevance" sections in each lesson guide that embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through the authentic application of SEPs. For example, the Unit B.7A

"Establish Relevance" section requires students to "hypothesize how their DNA differs with their thinking partner." Students then share their ideas to the class.

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

- The materials include "Engage" sections that allow students to leverage prior knowledge and experiences related to phenomena or engineering problems. For example, the "Unit B.7A Engage" activity leverages students' prior knowledge of variations in a population and nucleic acid structure and function to hypothesize "how their DNA differs from one another." Additionally, the "Engage" section in the lesson "8.13B Function of Genes," located in Category 2, uses students' prior knowledge of television shows they are familiar with to facilitate the activity.
- The materials do accommodate different entry points to learning phenomena through various means. For example, the "Unit B.7C Establish Relevance" section leverages students' prior experience in playing a game of "telephone" to connect to the unit phenomenon of "changes in DNA." The teacher leverages students' prior experience by asking questions like "How are changes in DNA similar to the changes in the repeated sentence?" to connect the experience to the unit phenomenon.
- In addition, the materials provide opportunities for students to leverage knowledge and experiences related to phenomena or engineering problems under the "Scientific and Engineering Practices" button located on the "Dynamic Biology Teacher's Guide." Eleven activities provide opportunities for students to leverage knowledge and experiences related to engineering problems. For example, "Conduct Investigations and Design Solutions," found on the second row of the table, provides four questions on one activity.
- Furthermore, on the My Courses/Biology dashboard, under the "TEKS Correlations" button, there are downloadable PDFs of labs that address SEPs. The material provides opportunities for students to leverage knowledge and experiences related to phenomena or engineering problems. For example, row five provides multiple labs that teachers may give students to practice SEPs.

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

- The materials contain "Lesson Guides" that clearly outline for the teacher the scientific concepts and goals behind each phenomenon and engineering problem through the "Recurring Themes and Concepts" table, information about the science concepts under the "Key Concepts" section of the "Teach and Discuss" component, as well as provide guiding questions for the teacher that clearly outline the goals behind each phenomena.
- For example, the "Unit 8.12A Disruptions of Energy Transfer in Food Webs " lesson guide clearly presents the phenomena through an image of a palm oil plantation where a rainforest had been clear-cut under the engage section. The guiding questions clearly outline the goal of the phenomena, "How do you think the flow of energy was impacted in this ecosystem?" Under the "Teach and Discuss" section, the goals of the science concepts are listed, such as, "Energy is well balanced in an ecosystem, and disruptions can affect this balance." Later within the lesson guide, the Recurring Themes and Concepts table clearly outlines the goals, which state, "[Students] analyze and explain how factors or conditions impact stability and change in systems." ." Additionally, the "Unit B.8A, Meiosis, and Sexual Reproduction" lesson guide clearly

presents an image of the phenomena of two black labs producing offspring with yellow and red fur. The guiding questions clearly outline the goal behind the phenomena, “How can offspring with the same parents look different from one another?” Under the “Teach and Discuss” section, the goals of the science concepts are listed, such as, “ Sexual reproduction involves two parents and results in offspring that are genetically unique from each parent.” The “Recurring Themes and Concepts” table further provides clarity by stating, “Patterns: Meiosis follows a predictable pattern, which helps increase genetic diversity.”

- The materials contain labs that clearly outline for the teacher the scientific concepts and learning goals behind each engineering problem that corresponds to science concepts across the course. For example, the “Identifying an Unknown Cell Type Descriptive Investigation” includes “Background Information” that includes the goal of the investigation. For example, it states, “By observing and learning about cells, scientists can better understand that all levels of life have systems...You will collect qualitative data by observing...You will record the presence of organelles....”

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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 in a way that builds in complexity, where students learn about foundational knowledge behind the course's knowledge and skills, then they apply and extend their learning within and across units. The "Scope and Sequence and Pacing Guides" found in the "Dynamic Biology Teacher's Guide" provides an outline that builds content across the Texas Essential Knowledge and Skills (TEKS). For example, in Unit B.5D, Viruses section, students must first work through "Key Concepts," including virus notes, sketches, and investigations, before they participate in the "Apply/Extend" activities, which include "Research from the Past Benefitting the Present" and "Epidemiology Research Project." Materials lay out the sequence by reporting categories to build and connect their knowledge within the unit. This unit progresses around Reporting Category 1, where students learn about biomolecules, cell types, homeostasis and cell transport, viruses, the cell cycle, cell differentiation, and cancer.
- Additionally, "Unit B.6C Disruptions of the Cell Cycle Lesson Guide," located in "Reporting Category 1," connects new learning to previous learning and builds content to build complexity. Before this lesson, students complete B.6A Cell Cycle and DNA Replication to understand the significance of the cell cycle and the stages and checkpoints necessary to create a new cell. Students need to apply this information to understand the causes of cancer. The activities within the lesson guide (Think-Write-Pair-Share Activity on the cell cycle and a Cell Cycle Disruption Writing Activity) also require this previous knowledge.

- This progression is also seen in the "Unit B.11A Matter and Energy Flow in Photosynthesis and Respiration" lesson that progresses in depth to Unit B.11B, Role of Enzymes lesson that continues with energy to detail its role in enzyme activation. Materials present concepts through sequenced engagement and lab activities, class discussion, modeling, and assessments.
- Furthermore, materials include "Students Will" statements that demonstrate how materials are designed for students to build and connect their knowledge and skills within and across units. For example, the "Unit B.7B Gene Expression Lesson Guide" contains the statement that students will "Describe the significance of gene expression and explain the process of protein synthesis using models of DNA and ribonucleic acid (RNA)." This statement builds knowledge of DNA mutations and connects to Unit B.7A DNA, where students learn about DNA structure and function.
- Materials include "Vertical Alignment" sections within each unit that cite how the science concepts connect to and extend the learning from previous grade levels. For example, "Unit B.13B Function of Genes" and "Unit B.8A Meiosis and Sexual Reproduction" both have "Vertical Alignment" sections that outline alignment to the seventh grade TEKS 7.13C. This vertical alignment shows how these two units help to build and connect students prior knowledge while also building and connecting knowledge and skills between the two units.

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

- The lesson guides include evidence of a progression of concrete and representational before abstract reasoning when presenting science concepts that allow for increasingly deeper conceptual understanding**.** For example, in "Unit B.13C Carbon and Nitrogen Cycle Lesson Guides" in "Reporting Category 5," students begin the lesson with questions about recycling programs and what they do with aluminum cans. The materials guide students through provided "Carbon Cycle Notes" and a "Carbon Cycle Diagram" activity before being asked to complete an "Engineering Design: Air Pollution Investigation." Throughout the lesson guide, students learn scaffolds from recycling cans (concrete) to the carbon cycle and then to an engineering design (abstract) for students to be successful in the final investigation. Additionally, in Reporting Category 5, the interdependence within environmental systems lessons provide a concrete example of models of interactions between organisms through the engage activity. The exploration activities progress from the specific role of organisms in the ecosystem to Exploration designed for students to analyze data by features and patterns to determine if the reintroduction of top predators reestablishes the original food web.
- In addition, the lesson guides allow for learning progression within lessons that allow for deeper conceptual understanding. For example, the "Unit B.7C Changes in DNA Lesson Guide" includes an intentional, scaffolded progression from an Engage and Establish Relevance section, which activates students' prior knowledge of changes in DNA, to a Teach and Discuss section, which instructs the course-specific core concept of types of mutations, to allow for increasingly deeper conceptual understanding.
- Furthermore, the "Lesson Guides" sequence instruction in a way that activates or builds prior knowledge before explicit teaching occurs. For example, within the "Unit B.13B Ecological Stability of Trophic Levels Lesson Guide" located in Reporting Category 5, the Establish Relevance section activates prior knowledge of students by asking, "What does eating a hamburger has in common with organisms" in the photo of the savanna. Students then review a picture of mushrooms on a decaying log. Students engage with the prompts and activate prior learning from sixth and seventh grade. Another example is located in Reporting Category 4,

where students “explain how matter is conserved, energy is transferred during photosynthesis and cellular respiration” in B.11A, then move on to “investigate and explain the role of enzymes in facilitating cellular processes” in B.11B. Students then analyze the interactions that occur among systems that perform several different functions in animals, in B.12A. Students “explain how the interactions that occur among systems that perform functions in plants are facilitated by their structures” in B.12B.

- Materials include “Scope and Sequence and Pacing Guides” found in the “Teacher's Guide” that outlines how materials are intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding. For example, the Scope and Sequence and Pacing Guides show that Unit B.5A Biomolecules is the first unit of instruction as a way to intentionally sequence learning in a way that allows for increasingly deeper conceptual understanding. Unit B.5A Biomolecules describes the function of the four biomolecules. In Category 2, students increase the depth of this knowledge as they learn about DNA, changes in DNA, and outcomes of genetic combinations.
- Furthermore, Reporting Category 5 provides concrete examples of models of interactions between organisms. The Engage activity models relationships between organisms, while the Explore activity progresses from the specific role of organisms in an ecosystem to an Exploration activity designed for students to analyze data by features and patterns to determine if the reintroduction of top predators reestablishes the original food web.

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

- The materials clearly and accurately present course-specific core concepts, science engineering, and practices (SEPs). The materials use the 5E (Engage, Explore, Explain, Elaborate, Evaluate) instructional model for sequencing science instruction to authentically incorporate SEPs. For example, the “Unit B.5A Biomolecules Lesson Guide” in Category 1 outlines the lesson in a 5E format. During “Engage,” students create sandwiches with all the biomolecules. They then go on to “Establish Relevance,” similar to the Explore phase, where they answer the prompt “How does making a sandwich relate to a cell?” Teachers then move on to “Teach and Discuss,” the Explain phase, where students complete research and participate in models and an investigation. Lastly, they “Apply and Extend” by practicing analogies. The lesson provides teacher guidance through course-specific concepts and accurately presents and ties in materials to each other, demonstrating the practice of SEP B.3B: Communicate explanations.
- Materials contain “Key Concept” sections in the “Lesson Guides” that clearly and accurately present course-specific core concepts and SEPs. The “Unit B.7B Gene Expression Lesson Guide” contains a Key Concepts section that clearly and accurately presents the course-specific concepts of gene expression. Activities, with their associated SEPs, are included as concepts are presented to build on these concepts. For example, the “Interactive - Transcription and Translation” activity in which “students will navigate to Biology Interactives and perform protein synthesis simulations” identifies the following SEPs: “[SEP B.1G] Develop and use models, [SEP B.4A] Analyze, evaluate, and critique scientific explanations.”
- The materials include “Biology Interactives” that present course-level core concepts and SEPs in a scientifically accurate way. Materials present lab investigations that accurately connect all of these pieces of information. For example, the “Unit B.7C Changes in DNA Lesson Guide” contains an interactive called “Mutations Virtual Lab,” which clearly and accurately presents the core concepts of types of mutations, and SEP B.4A, where students analyze experimental testing to encourage critical thinking. In addition, the “Photosynthesis Investigative Lab” in “Reporting

Category 4" allows students to explore the effect of light on photosynthesis covering SEPs B.1E collects quantitative and qualitative data, and B.1F organizes quantitative and qualitative data.

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

- Lesson Guides include specific learning targets for each lesson that are within the boundaries of the course's main concepts. For example, the "Unit B.5C Homeostasis and Cellular Transport Lesson Guide," located in Reporting Category 1, provides specific learning objectives at the beginning of the guide. The guide states students will "investigate homeostasis through the cellular transport of molecules." In addition, the "B.13B Ecological Relationships & Ecological Stability Lesson Guide" located in Reporting Category 5 includes the learning target, "Students Will: Explain how environmental change, including change due to human activity, affects biodiversity and analyze how changes in biodiversity impact ecosystem stability." Within the materials, teacher guidance includes "Vertical Alignment" to sixth and seventh grade, Key Concepts, coordinated SEPs to investigations, and Recurring Themes and Concepts. Since students will be studying ecological relationships, the vertical alignment guides teachers on prior learning on relationships, hierarchy, and ecosystem stability, providing clarity on the boundaries of the course.
- Materials include Concept Mastery sections in the "Student Learning Resources" that clearly define the boundaries of content that students must master for the course. For example, Unit B.8B Formative Assessment 1 and Unit B.8B Formative Assessment 2 both include assessment questions related to Mendelian genetics and non-Mendelian topics like codominance, incomplete dominance, sex-linked traits, and multiple alleles, which are within the boundaries of the main concepts taught in the Unit B.8B Outcomes of Genetic Combinations lesson.
- In addition, materials contain "Study Guides" that demonstrate mastery requirements within the boundaries of the course's main concepts. For example, Unit B.7C, Changes in DNA Study Guide, assesses the mastery of DNA mutations (substitutions, insertions, and deletions), chromosomal mutations, and their effects. These topics are within the boundaries of the main concepts of Unit B.7C, Changes in DNA.

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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 include lesson guides that 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 (SEPs). For example, the "Unit B.8B Outcomes of Genetic Combinations Lesson Guide," located in Reporting Category 2, has subsections for Vertical Alignment and Key Concepts. These subsections outline how the course-appropriate prior knowledge of the eighth grade TEKS 8.13B "genes in determining the inheritance of offspring" will help guide the development of Unit B.8B course-level content and science and engineering practices, like using and developing models (SEP B.1G) to learn Mendelian and non-Mendelian genetics. Another example is the "Unit B.13D Environmental Change, Biodiversity, and Ecosystem Stability Lesson Guide" located in Reporting Category 5, which includes eighth-grade content strands such as "Ecological Succession and Impact of Biodiversity on Stability of Ecosystems." The materials state, "In sixth grade, students describe how variations in a population contribute to survival in a changing environment." The "Unit 8.12B Lesson Guide" includes the Vertical Alignment section, which guides the teacher on prior knowledge from sixth grade and student expectations for ninth grade.
- In addition, the "Unit 8.13B Function of Genes Lesson Guide," located in Reporting Category 2, provides a table that outlines course-related prior knowledge of "how natural and artificial

selection change the occurrence of traits in a population over generations" to help guide the development of course-level content, such as "how the nucleotide sequence specifies some traits of an organism." "Unit B.11A Matter and Energy Flow in Photosynthesis and Respiration Lesson Guide," located in Reporting Category 2, provides material in logical and progressional order. TEKS covered in grade 6 are identified (students describe cell theory and explain the cellular composition of organisms (6.13A)) as well as eighth-grade TEK (students identify the function of plant and animal cell organelles (8.13A)) which lead to Reporting Category 4 TEKS B.11A - explain how matter is conserved. Energy is transferred during photosynthesis and cellular respiration using models, including the chemical equations for these processes.

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 misconceptions, supporting teachers' knowledge, and recognizing barriers. The lesson guides identify common course-level misconceptions students may have about science concepts. For example, the Overview of the Cell Cycle section in "Unit B.6A Cell Cycle and DNA Replication Lesson Guide" points out, "One misconception is that students may not realize how organisms grow." The lesson guide continues to explain how organisms grow and other misconceptions. The materials explain Key Concepts and bold important concepts with explanations underneath. In the "Unit B.5A Biomolecules Lesson Guide," the Key Concepts section contains explanations and examples to guide the teacher. The materials provide misconceptions about the primary function of a protein and give examples of what proteins do. Additionally, the "Unit B12.A Interactions Among Animal Systems Lesson Guide," located in Reporting Category 4, states that "students often have the misconception that the body systems only work independently. Body systems must work together to complete life functions."
- Furthermore, materials include Teach and Discuss sections in the lesson guides that 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. For example, the "Unit B.8B Outcomes of Genetic Combinations Lesson Guide" contains a Teach and Discuss section that addresses the grade-level misconception: "Since a Punnett square for a monohybrid cross shows the probability of four genetic possibilities, students may think that, if a family has four children, all four possible outcomes will occur." Additionally, in the "Unit B.8B Outcomes of Genetic Combinations Lesson Guide," the Teach and Discuss section addresses core concepts regarding Mendelian and non-Mendelian genetics. These explanations of a misconception and core-concept explanations support the teacher's subject knowledge of monohybrid crosses and address a barrier to student conceptual development.
- E-Posters include background information for teachers that explains science concepts. For example, the "Unit B.8B Outcomes of Genetic Combinations E-Poster" contains examples and explanations of solving monohybrid crosses, which supports the teacher's subject knowledge.
- Materials include "Teacher Background" links in the lesson guides that contain adult-level explanations and examples of the more complex course-level concepts and concepts beyond the current course so that teachers can improve their knowledge of the subject. For example, the "Unit B.7B Gene Expression Lesson Guide" located in Reporting Category 2 contains a link called "Teacher Background" that contains examples and explanations of gene expression, which supports the teacher's subject knowledge.

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

- The materials provide a framework explaining the program's main intent, highlighting key features of the instructional design. For example, the “Teacher's Guide” located in “Teacher Resources” provides embedded support for the Course Design, which has documents that explain the philosophy of the materials and provide an “Online Course Site Map” to help explain the purpose of the instructional design of the program. The “Philosophy” document details how the materials have been intentionally designed for Texas students by saying, ”Our curriculum is built specifically to the TEKS, ELPS, SEPs, and RTCs.” Additionally, the Teacher's Guide provides a Teaching and Learning section that contains a document called the “Dynamic Science Course Overview” to explain the intent of the instructional design of the program to promote “Texas to become the #1 state in the US for Science Teaching and Learning.” The Dynamic Science Course Overview states that to achieve this goal of being number one, “our students need a Dynamic Science curriculum.”
- The materials provide a rationale for using the 5E model for learning. Materials give reasons to support the model, such as the 5E model being student-centered instead of teacher-centered, and explain why materials are designed the way they are. For example, the 5E subsection located in the Course Design section of the “Teacher's Guide” provides a rationale for the 5E Model design as follows: “Our instructional model incorporates all of the elements of 5E and more. Our curriculum is flexible, interactive, and hands-on. It is designed for students to struggle productively and succeed with multiple learning pathways. We believe in building a community of learners through engaging activities that appeal to various learning modalities and diverse learners. We believe in teachers having the autonomy to make sound instructional decisions using various instructional methods. And that students build knowledge through exploration, collaboration, and teacher guidance.”

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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.

- Materials include "Lesson Guides" that consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. The lesson guides include "Literacy Connection" activities and "STEM Career Literacy Connections," which include additional reading and writing opportunities as scientists and engineers. For example, in the Literacy Connection activity in the "Unit TEKS B.5B Prokaryotic and Eukaryotic Lesson Guide," students research an example of endosymbiosis, summarize, and justify their answers. In addition, in the "Literacy Connections-Reproductive Success Frayer Models" activity located in the "Unit B.10B Differential Reproductive Success Lesson Guide," students research and then design solutions to the problems provided. Students write responses for each section of the Frayer model in their journals.
- In addition, materials contain Key Concepts sections in the lesson guides that consistently support students' meaningful sensemaking. For example, the Key Concept section in the "Unit

B.7A DNA Lesson Guide" has multiple activities that promote sensemaking through reading, writing, thinking, and acting as scientists and engineers. First, the "DNA—It's Out of This World" activity requires students to read an article from *ScienceNews* and think and act as scientists to construct written responses to question prompts. Students get consistent exposure to these skills in the following activity, "DNA Image Analysis," as they read DNA diagrams, think and act as scientists to make sense of the diagrams, and write responses to questions about them.

- The materials consistently provide learning activities that support students' meaningful sensemaking through virtual labs. For example, in the "Osmosis Virtual Lab" located in the "Category 1-Biology Interactives" of the Student Materials, the materials ask students to write observations, compare cells, and draw cells in hypertonic states. The student materials provide space for students to answer, "Draw a picture of both the plant and animal cells in a hypotonic state" or "Describe the environment the cells are in when they are in an isotonic solution." Another example is located in the "Unit B.10A Natural Selection Lesson Guide" in the Teach and Discuss section, where students conduct a "Natural Selection Virtual Lab." Students navigate to "Biology Interactives" and run simulations to investigate the role of background color in the reproductive success of beetles. The students plan and conduct investigations, collect quantitative and qualitative data, organize quantitative and qualitative data, and analyze data by identifying features, patterns, and limitations.
- In addition, materials provide investigative opportunities, where students learn from activities while acting as scientists and engineers. For example, in the "Unit B13.D Environmental Change, Biodiversity, and Ecosystem Stability Lesson Guide" in the "Invasive Species Engineering Design" activity, students are presented with background information to read about invasive species. Students must determine what invasive species are in their community and how to engineer a solution to the problem. They design a prototype and write a "one-page proposal to persuade an ecological company to produce your group's design."

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

- Materials include "Lesson Guides," which contain various activities that provide multiple opportunities for students to engage with grade-level appropriate scientific texts to gather evidence and develop an understanding of concepts. For example, the "Unit B.7A DNA Lesson Guide" contains an activity called "DNA—It's Out of This World," which requires students to read an article from *ScienceNews* about the origin of DNA nitrogenous bases to help develop research skills and an understanding of complementary base pairing of DNA strands. Additionally, the "Unit B.7A Lesson Guide" also contains an activity called "Researching the Origin of DNA," which requires students to navigate to *ScienceNews* and select an article to research the origin of DNA. This activity further develops students' research skills as they gather evidence regarding the origin of DNA.
- The materials provide multiple opportunities for students to engage with scientific texts to gather evidence and develop an understanding of concepts. For example, in the Teach and Discuss section located in "Unit B.9B Rates of Change in the Fossil Record Lesson Guide," students distinguish between the theory of gradualism proposed by Charles Lyell and the theory of punctuated equilibrium proposed by Stephen Jay Gould and Niles Eldredge by researching the two theories. Students then create a newspaper article explaining the theories proposed by the scientists. In addition, in the "Accumulation of Contaminants" activity located in "Unit B.13D Environmental Change, Biodiversity, and Ecosystem Stability Lesson Guide," students read an excerpt about the pesticide DDT to develop an understanding of bioaccumulation in food webs.

- The materials provide "Literacy Connections" for students to engage in purposeful and targeted activities with appropriate scientific texts for the course. For example, in the "Literacy Connections: Murder in Chicago" activity in "Unit B11.A Matter and Energy Flow in Photosynthesis and Respiration Lesson Guide," students complete a literacy activity to further research cellular respiration. They read the expository text and write answers to questions about the reading.
- The materials provide opportunities for students to engage with scientific texts, including activities, such as pre-reading and vocabulary, to help them develop an understanding of concepts. For example, in the "Unit B.13C Carbon and Nitrogen Cycle Study Guide," students use an infographic from NASA to read information and answer reflective questions about the content such as, "Use the infographic from NASA to answer the following questions and explain the significance of the increasing level of carbon dioxide on Earth." In addition, the study guide includes a vocabulary activity for students to complete before reading.

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 contain "Lesson Guides" that 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. Within the "Unit B.5D Viruses Lesson Guide" located in Category 1, the materials provide sentence stems for students to write, use a graphic organizer, create a comic strip, and research epidemiology. In the graphic organizer, students take notes on viruses, and it states, "Your teacher will instruct you to trade papers with a partner. Share information and discuss necessary corrections." A more specific example is in the "Unit B.7D Molecular Technologies Lesson Guide," which contains an activity called "Case Studies of Gel Electrophoresis Application." This activity provides opportunities for students to engage with both written text and graphic data, represented by electrophoresis results. Students use the text and graphic data to solve a mystery and develop an understanding of how molecular technologies are relevant to science. An additional example is the "Environmental Concepts Map" activity found in the Apply and Extend section located in the "Unit B.10B Differential Reproductive Success Lesson Guide." Students create a concept map evaluating how various environmental pressures influence the evolution of individuals in a population.
- Additionally, the materials provide study guides that support students in developing and displaying an understanding of scientific concepts. For example, the "Unit B.5C Homeostasis and Cellular Transport Study Guide" in Category 1 provides a graphic organizer for vocabulary, tables for developing concepts, and drawing models. Students draw images for cell transport and explain the type of transport.
- Students record their ideas, questions, drawings, charts, and graphs in their student notebooks to discuss and revise their understandings at various lesson stages. For example, in the "Energy Transfer and Loss in Ecosystems: Read and Discuss" activity located in the "Unit 7.12A Flow of Energy in Trophic Levels Lesson Guide," materials provide students with the opportunity to explore a narrative about the Florida Everglades ecosystem and answer questions in their notebook. After reading an article and discussing it with students, they are directed to answer the following questions in their science notebooks: "How does energy flow in a food web? Why is some energy lost between trophic levels?"

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

- Materials include model activities that 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. For example, the “Cell Membrane Model” activity in the “Unit B.5A Biomolecules Lesson Guide” instructs students to create a cell membrane model. Afterward, students answer multiple questions asking them to reflect on their findings. In Question 2, students create a sentence about the function of biomolecules. They share it with a partner and brainstorm a more detailed explanation. For their model, students answer questions reflecting on the advantages and disadvantages of their models. Later in the lesson guide, students use the information to create summaries of biomolecules, analogies for biomolecules, and a mind map to transfer learning.
- Additionally, the “Build a Model” activity in “Unit B7.B Gene Expression Lesson Guide” allows students to act as scientists and engineers to design a model of protein synthesis. In this activity, students apply concepts learned about protein synthesis to create their model. Students can develop a deeper understanding of concepts and productively struggle as they create an explanation of their model and answer questions.
- Materials include investigations that provide authentic student engagement and perseverance of concepts through productive struggle while acting as scientists and engineers. For example, “Unit B.8B Outcomes of Genetic Crosses Investigation: Are Punnett Squares Reliable” allows students to act as scientists as they experiment with candy pieces to make sense of predicting the reliability of monohybrid crosses. Additionally, this activity supports students in productive struggles as they are tasked to design their own “simulation for non-Mendelian traits similar to the one you completed in Part 1 for non-Mendelian traits.”
- The materials support students as practitioners while they are figuring out (sensemaking) and productively struggling. For example, materials prioritize students making evidence-based claims to construct explanations of how and why the phenomenon or problem occurs. For example, in the “Unit B.10B Differential Reproductive Success Lesson Guide,” students act as scientists using the “DDT Adaptations CER” activity. Students analyze data regarding the pesticide DDT and observe its effects on the mosquito population. The materials state, “The student organizes quantitative data using bar graphs, analyzes data by identifying significant features and patterns, develops explanations supported by data, and engages respectfully in scientific argumentation.”

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Indicator 5.1

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

1	Materials prompt students to use evidence to support their hypotheses and claims.	M
2	Materials include embedded opportunities to develop and utilize scientific vocabulary in context.	M
3	Materials integrate argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and course.	M
4	Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations to phenomena and/or solutions to problems using evidence acquired from learning experiences.	M

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials promote students' use of evidence to develop, communicate, and evaluate explanations and solutions.

Materials prompt students to use evidence to support their hypotheses and claims. Materials include embedded opportunities to develop and utilize scientific vocabulary in context. Materials integrate argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and course. Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations to phenomena and/or solutions to problems using evidence acquired from learning experiences.

Evidence includes but is not limited to:

Materials prompt students to use evidence to support their hypotheses and claims.

- The materials provide opportunities for students to develop how to use evidence to support their hypotheses and claims through investigations. For example, in the "Unit B.5C Homeostasis and Cellular Transport Lesson Guide," students complete a lab on osmosis using potatoes and design their follow-up lab. The materials prompt the students at the end to "write a conclusion stating what you learned" and "Do your results support your hypothesis? Explain your answer."
- The materials specifically prompt students to use evidence when supporting their hypotheses and claims. For example, the "Unit B.7D Molecular Technologies Lesson Guide" contains an activity called "CER GMOs" that prompts students to find evidence to support their claim to the prompt "Research and write a scientific explanation on whether the risks of having GMO foods in agriculture outweigh the benefits." This activity directly prompts students to use evidence to support their claim by providing a Claim, Evidence, and Reasoning (CER) graphic organizer. Criteria for a successful CER activity are provided as a rubric, describing perfect support of claims as "Reasoning includes whether the findings supported the hypothesis, possible sources of error, and what was learned from the research."

- In addition, materials include "Apply and Extend" activities in the lesson guides that prompt students to use evidence to support their hypotheses and claims. For example, the "Unit B.7C Changes in DNA Lesson Guide" contains an "Apply and Extend" activity called "Are All Mutations Dangerous? Should I Be Worried?" that prompts students to use evidence to support various claims and hypotheses that they make in response to three different real-world examples of mutations. In the first example, students analyze the mutation that can cause cat hairlessness. In response to this mutation, students create a claim to answer the question, "Do you think all mutations are harmful?" The activity prompts students to defend their claim, using evidence from the hairless cats, by immediately asking, "Why or why not?"
- Furthermore, materials specifically prompt students to use empirical evidence when supporting their hypotheses and claims. For example, the "Skills Companion" for the "Use Evidence to Communicate Finding" lesson located in "Science and Engineering Practices" informs students how scientists develop explanations and propose solutions, where scientists might communicate findings, and formats used by scientists. The lesson explains scientific argumentation as a process by which scientists defend claims, "presenting and defending a scientific claim using evidence, logic, and reasoning."

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

- Materials include "Biology Interactives" that include embedded opportunities for students to develop and utilize scientific vocabulary in context. For example, "Unit B.7C Changes in DNA Biology Interactive," titled "Mutations Virtual Lab," allows students to practice and develop their scientific vocabulary regarding mutations by observing the effects of substitution, insertion, and deletion mutations. In this interactive, students drag and drop DNA bases to simulate substitution, insertion, and deletion mutations. After completing the "Mutations Virtual Lab," students are quizzed on their vocabulary knowledge on five multiple-choice questions, like "What kind of mutation is this?"
- The lesson guides include embedded opportunities to present scientific vocabulary using multiple representations. For example, in the "Unit B.6B Cell Differentiations Lesson Guide," students start with an "Engage" activity that introduces prior knowledge vocabulary. The materials state, "include the terms DNA, RNA," and "elicit student responses with these terms." Students then move through several activities, such as a CER activity on environmental factors in gene expression. Then students complete the "Musical Chain Notes," where they "use current language and learn new vocabulary" by rotating through prompts when the music stops. In addition, "Engage" activities provide opportunities for students to apply scientific vocabulary within context. For example, in the "Engage" activity titled "What Role Am I Playing, Again?" located in "Unit B.13B Ecological Stability of Trophic Levels Lesson Guide," students match organisms with their tropic roles in a marine ecosystem after reading the background information. Students are presented with various organisms and choose if the organism fits the role of producer, herbivore, carnivore, omnivore, detrivore, or decomposer. Students are directed to use online references to determine the organism's role. Students are then presented with a soil food web and asked to identify the role of each organism in the diagram. The lesson continues with questions referencing roles in food chains, food webs, and trophic levels. Furthermore, materials provide study guides for each lesson, allowing students to practice developing and utilizing scientific vocabulary. For example, the "Unit B.13B Ecological Stability of Trophic Levels Study Guide" provides a list of core vocabulary and the following lesson: "Students identify the correct word which fits the concept map definitions. Students then apply knowledge of words to trophic levels, food webs, and energy pyramids." Lastly, students end the

lesson by explaining how disrupting the cycling of matter in an ecosystem affects an organism's survival.

- "Teach and Discuss" sections in the lesson guides provide experiences with new concepts and opportunities to use the vocabulary presented. For example, the "Unit B.7C Changes in DNA Lesson Guide" contains a Teach and Discuss section that includes an activity called "Changes in DNA Three-Column Notes." In this activity, students complete a graphic organizer that offers pre-reading practice for unit vocabulary. The graphic organizer requires students to summarize "the main idea. It could be a phrase or a key vocabulary word." Then, students "write details about the main idea or vocabulary word" and log a memory clue to serve as a reminder for the vocabulary word. This graphic organizer allows students to develop and utilize unit vocabulary in context. Additionally, in the "Teach and Discuss" activity called "Evidence of Evolution One-Pager" found in the "Unit B.9A Evidence of Common Ancestry Lesson Guide," students watch a video to analyze evidence of common ancestry and then write a one-page summary of the evidence in the video. The students include "Four vocabulary words or phrases around the image that express the main idea," as stated in the paper requirements.

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

- The materials integrate argumentation and discourse throughout to support students' content knowledge and skills development as appropriate for the concept and course through "Apply and Extend" activities. For example, in the "Unit B.5D Viruses Lesson Guide," located in Category 1, students participate in the "Apply and Extend" activity titled "Research From the Past Benefiting the Present," where the materials provide opportunities for students to develop a position on vaccines and support their claims. The student then shares their position in the group "by agreeing, adding more information or respectfully disagreeing while justifying the text." Additionally, in the "Apply and Extend" activity titled "DDT Adaptations CER" located in the "Unit B.10B Differential Reproductive Success Lesson Guide" in Category 3, students "analyze data regarding the pesticide DDT and observe its effects on the mosquito population." Students organize and analyze data "by identifying significant features and patterns, develop explanations supported by the data, and engage respectfully in scientific argumentation."
- The materials integrate argumentation and discourse within stages of the learning cycle, supporting student development of content knowledge and skills. For example, the "Teach and Discuss" section of the "Unit B.7A DNA Lesson Guide" contains an activity called "Origin of DNA-Critical Thinking Question." In this activity, students participate in discourse with a partner to discuss questions regarding the origin of DNA. Materials instruct students to discuss answers to questions like "distinguish why the theories of the origin of DNA are not hypotheses" with their partners and "after collaborating, be prepared to share your response with the class."
- The materials include a "Science and Engineering Practices" section that provides opportunities for students to develop how to engage in argumentation and discourse, supporting student content knowledge and skills development. For example, the "Skills Companion" for the "Use Evidence to Communicate Finding" lesson located in "Science and Engineering Practices" provides an opportunity for students to develop knowledge of how to engage in argumentation and discourse by defining scientific argumentation as "presenting and defending a scientific claim using evidence, logic, and reasoning." In addition, students participate in an activity in the "Skills Companion" to practice these skills by individually working on the scenario: "Imagine you walk into the laboratory tomorrow to find an array of materials at your lab station. Which material works best to keep a drink warm? What steps would you take to develop an

explanation using evidence and reasoning?" Then, students participate in argumentation and discourse with a partner to revise their answers to this scenario.

Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations of 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 verbal arguments that justify explanations of phenomena and/or solutions to problems using evidence acquired from learning experiences. For example, in the "Gene Expression CER" activity in "Unit B.6B Cell Differentiation Lesson Guide," students learn about differentiation. The materials divide students into groups to study differentiation in organisms, use a graphic organizer, and fill out a CER. Afterward, students critique and discuss writing by "comparing responses with classmates."
- The materials include lesson guides that contain activities that provide opportunities for students to justify explanations of phenomena and solutions to problems using written and verbal arguments using evidence acquired from learning experiences. For example, the "Unit B.7D Molecular Technologies Lesson Guide" contains an activity called "Case Studies of Gel Electrophoresis Application" that requires students to analyze gel electrophoresis samples to solve three problems, one being a murder mystery. In this activity, students construct written arguments that justify their answers to the question, "Did the gel electrophoresis help Dr. Gene Poole solve the murder?" After students construct written arguments for all three problems, materials provide opportunities for students to construct verbal arguments for the problems by prompting students to "discuss your findings with a classmate."
- In addition, lesson guides include "Apply and Extend" activities that provide opportunities for students to justify explanations for solutions to problems using empirical evidence. For example, in the "Apply and Extend" activity titled "Fossil Record: Quiz, Quiz, Trade" located in "Unit B.9B Rates of Change in the Fossil Record Lesson Guide" in Category 3, students develop and ask questions based on information and investigations to "examine the varying rates of change in the fossil record in a cooperative activity." Students "communicate explanations collaboratively and engage respectfully in scientific argumentation using empirical evidence."
- The materials provide instruction for constructing and presenting a verbal and written argument to problems using evidence acquired from learning experiences. For example, in the "Teach and Discuss" activity titled "Investigation-Butterfly Camouflage Descriptive Guide" located in "Unit B.10A Natural Selection Lesson Guide" in Reporting Category 3, students design and conduct a descriptive lab investigation to determine how the adaptation of camouflage can lead to the natural selection of butterflies. Students organize qualitative data and propose solutions supported by models. They then critique scientific explanations and solutions by using experimental testing. An additional example can be found in the "Teach and Discuss" section titled "Engineering an Ecological 3D model" located in "Unit B13.B Ecological Stability of Trophic Levels Lesson Guide" in Reporting Category 3, which provides a lesson in which "Students will develop a three-dimensional model representing the trophic interactions and energy flow for a specific community or ecosystem. They will explain the model to the class in a three- to four-minute presentation."

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Indicator 5.2

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

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

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials provide teacher guidance to support student reasoning and communication skills.

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

Evidence includes but is not limited to:

Materials provide teacher guidance on anticipating student responses and the use of questioning to deepen student thinking.

- The activities provide teacher guidance on anticipating student responses and the use of questioning to deepen student learning. In each lesson guide, the materials provide enriching student activities based on the TEKS taught. For example, in the activity "What Cells Am I?" located in "Unit B.5B Prokaryotic and Eukaryotic Cells Lesson Guide," the materials prompt the teacher to "ask students: What type of cells are you made of..." and provides a "suggested student response is, 'I am made of eukaryotic cells...'."
- In addition, materials include "Apply and Extend" sections of lesson guides that contain activities that provide teacher guidance on anticipating student responses and the use of questioning to deepen student thinking. The "Unit B.7C Changes in DNA Lesson Guide" contains an "Apply and Extend" section with an activity called "Are All Mutations Dangerous? Should I Be Worried" that provides teacher guidance on questions to discuss various strange mutations and potential student responses to these questions. For example, the "Are All Mutations Dangerous? Should I Be Worried?" document introduces a hairless cat as a mutation and guides teachers to ask questions like "Why does the Peterbald kitten not have hair?" Underneath the question, a sample student response of "A genetic mutation occurred. The gene responsible for hair growth has been changed, and hair loss is the result" is provided to guide teachers in leading a discussion with students.

- The materials support teachers to deepen student thinking through questioning in every engaging component. For example, the "Engage" section in the "Unit B.10C Speciation Lesson Guide" states, "Pose the following question to students, 'Do you think that humans are still evolving?'" The teacher then allows the student to "discuss this with their thinking partner" and "calls on a few students to share their ideas." The teacher informs students "that scientists believe that humans are evolving through natural selection." The teacher asks, "Do you think that natural selection will cause a new human-like species to evolve in the future?" The teacher is instructed to "not correct misconceptions. Allow students to share their explanations. Clarify that at this point, the class is exploring all possible ideas."
- The materials provide teachers with possible student responses to questions and tasks that support students during investigations. The "Teacher Copy of Investigations" supplies anticipated student responses. For example, the "Unit B.11B Investigation: Elephant Toothpaste," in which "student will investigate the effect of an enzyme on hydrogen peroxide," guides students through investigation and furthers deeper understanding of concepts with follow-up questions to which the teacher copy provides anticipated student responses. For example, "If you've made bread, what is added to the bread dough that makes it rise? What connection might there be between yeast cells and H2O2? Yeast is used as a catalyst in the baking process. It binds to sugar and breaks it down, forming carbon dioxide, which causes the dough to rise. Answers will vary about the connection between yeast and hydrogen peroxide. Accept all answers without explanation. You may write these on the board for later discussion."

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

- The materials provide embedded support for the teacher in scaffolding students' development of scientific vocabulary related to the concepts being taught. For example, the "Organisms in an Ecosystem-Teacher" activity located in "Unit B.13A Ecological Relationships and Ecological Stability Lesson Guide" provides the following directions: "1. Project the images. 2. Discuss with the students: a. What interactions are occurring between the two organisms? b. What advantages, if any, are there for their populations? c. What adaptations, if any, do these organisms have to help them in this situation? 3. Using prior knowledge, the students should determine how the image illustrates interdependence and, if possible, identify the ecological relationship. These images are designed to generate interest in the concepts of this TEKS. If students do not remember the types of relationships or are not familiar with the scenario, explain that, as the lesson progresses, they will learn more about these relationships. Introduce vocabulary later in the lesson."
- The lesson guides include teacher guidance on scaffolding and supporting students' development and using scientific vocabulary in context through activities. The lesson guides provide "Establish Relevance" sections, which incorporate prior learning and vocabulary that will be used throughout the lesson. For example, in the Establish Relevance section located in the "Unit B.13B Ecological Stability of Trophic Levels Lesson Guide," the materials guide the teacher to ask students, "Do you know that all life on Earth would not be sustainable without decomposers?" and guides defining the roles of decomposers and autotrophs. The materials scaffold vocabulary in context in a subsequent activity, "What Role Am I Playing, Again?-Teacher." Students identify the roles of organisms based on reading materials and using models, such as a food web.
- In addition, lesson guides include "Teach and Discuss" activities that include teacher guidance on scaffolding and supporting students' development and use of scientific vocabulary in context.

For example, the “Unit B.7C Changes in DNA Lesson Guide” contains a “Teach and Discuss” activity called “Changes in DNA Three-Column Notes,” which provides teacher guidance to implement this activity as a way to allow students to “demonstrate listening comprehension and offer pre-reading support.” In the “Changes in DNA Three-Column Notes” activity, students develop vocabulary by writing “the main idea...or vocabulary word,” then writing “details about the vocabulary word,” and writing “a memory clue” about the vocabulary word. This activity provides teacher guidance on scaffolding and developing students’ scientific vocabulary in context. Immediately following the “Changes in DNA Three-Column Notes” activity, teachers are guided on how to further develop students’ scientific vocabulary in context in an activity called “Mutation Strip Lab,” in which students apply their knowledge of vocabulary words, like “substitution mutation” to various mutation scenarios.

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

- Materials include CER activities that provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims. For example, the “Unit B.7D Molecular Technologies Lesson Guide” contains a CER activity called “CER GMOs” that has a prepared Claim-Evidence-Reasoning prompt for students to investigate “whether the risks of having GMO foods in agriculture outweigh the benefits.” This activity provides sample student responses for all three CER categories, and teacher guidance for supporting students in using evidence to construct written and verbal claims is provided as a rubric to evaluate student responses. Teacher guidance on preparing for student discourse is provided as materials prompt teachers to lead a follow-up discussion about the CER activity, in which “students will take turns presenting their claims and justifying them with reasoning and evidence. The class will then conclude which claims are best using their justification and reasoning.” In this discourse, teachers are guided to instruct students to “participate respectfully by listening carefully to presenters, asking questions, or providing constructive input.”
- The materials provide teacher support to prepare for student discourse. For example, the “Science Writing/CER” located in the “Teacher’s Guide” guides teachers on the CER framework and provides a rationale, definition, and examples. In addition, the SEPs materials provide teacher guidance in preparing for student discourse and using evidence to construct written and verbal claims. The SEPs provide presentations for teachers to guide students on using evidence and data to support their claims. In the SEPs material, “Use Evidence to Communicate Findings,” located in the “Teacher Resources,” the presentation describes “How to Develop Explanations,” “Communicating Explanations and Solutions,” and “Scientific Argumentation Using Applied Scientific Explanations.” The materials give an example, “Your teacher asks the class, ‘What is the best way to cook an egg?’” and provides students with information on how to make a claim. Furthermore, materials include “Introduction to Science” Powerpoints located in the “Supplemental Resources” of the “Teacher Resources,” which explain in detail how students are expected to participate in “Scientific Conversations.” The presentation instructs students to be observant, write down questions, respectfully relay their observations, and listen to observations others have gathered. The materials model how students use data to support claims with provided sentence stems: “When scientists share their ideas, they may say:
    - I observed…
    - I noticed...
    - I think... because …

    - My data shows...
    - The evidence supports."
- The materials include "Establish Relevance" sections in the lesson guides that provide teacher questions for supporting student discourse and using evidence in constructing written and verbal claims. For example, the "Unit B.8A Meiosis and Sexual Reproduction Lesson Guide" contains an Establish Relevance section that asks students to discuss the driving question of "Would the (football) team be as successful if all athletes had the same physical build and athletic traits?" Teacher guidance is provided through a sample answer that uses the evidence, "If all players had the same traits, there would not be specialization in a certain position," to justify the claim that "the team would not be as successful without diversity." The sample response also suggests that "the diversity within a team allows players to use their unique strengths at specific positions" to further support teachers in guiding students in discourse about this driving question.

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

- Materials include "Engage" and "Establish Relevance" sections in the lesson guides that support teachers in facilitating the sharing of students' thinking and finding solutions. For example, the "Unit B.7C Changes in DNA Lesson Guide" has an Engage section that has students play a game of telephone "as an analogy for changes in DNA." Teacher guidance for this Engage activity is provided in the form of instructions that include game rules and ways to further engage students in the activity, like "Allow one class of students to create a sentence and use it with your next class." Then, in the Establish Relevance section, teacher guidance for facilitating a discussion and the sharing of students' thinking is provided as questions, with scaffolds based on the Engage activity, are listed. The teacher begins the discussion with the question, "What is the difference between the two sentences," but if students struggle to answer, the teacher is provided with a scaffolded, reworded question, "Identify the words that changed in repetition." In this way, materials direct teachers to facilitate a student discussion, where students share the implications and findings of the effects of the change in words for the sentence in their game of telephone.
- The materials provide teacher support and guidance to engage students' thinking in various modes of communication throughout each scope within the course. For example, in the "Unit B.6C Uncontrolled Cell Division Lesson Guide" located in Reporting Category 1, the "Teacher Notes" for "Oh NO!! I have moles. Are they cancerous? - Teacher" activity guides teachers that not all "moles, freckles, and other skin tags turn into cancer," to "encourage students to discuss, talk" and for teachers to "walk around the classroom listening to students' observations and clarify when needed."
- The materials provide "Apply and Extend" activities throughout the materials to support and guide teachers in facilitating the sharing of students' finding solutions. For example, in the Apply and Extend investigation titled "Other Mechanisms of Evolutions Lab" in the "Unit B.10C Speciation Lesson Guide" located in Reporting Category 3, the teacher first provides background information on mechanisms of evolution, including "genetic drift, gene flow, mutations, and genetic recombination." The guiding question posed by the teacher is, "How do evolutionary mechanisms change a population's gene pool?" Students then "model genetic drift, gene flow, and mutations to demonstrate evolution in a population" by "asking questions and defining problems, planning and conducting descriptive investigations, organizing quantitative and qualitative data, developing explanations, and proposing solutions." An additional example is

the Apply and Extend activity titled “Beyond 2030: Designing the Future Space Station,” located in “Unit B.13B Ecological Stability of Trophic Levels Lesson Guide” in Reporting Category 5. The teacher guide provides teacher support and guidance in student investigation of creating a space station. Materials direct the teacher with assigned tasks and questions the student must answer. For example, “Students will design a variety of components and procedures. The diagrams and report should include the following:

- A description of design features to support a self-sustaining space station
- A description of the flow of matter and energy in the space station
- How food and oxygen will be provided and the waste removed
- How the internal atmosphere will be maintained for healthy human life
- How disruptions to the self-sustaining processes could be met.”

Summit K12 Dynamic Biology

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

- The lesson guides include diagnostic assessments in the Engage section to provide teachers with information to monitor progress and identify learning gains in various formats. For example, the Engage section in "Unit B.6B Cell Differentiation Lesson Guide" contains the "Candled Chicken Egg - Teacher" document that says, "as students to use their knowledge about DNA" from their "Middle school science TEKS [which included] the terms DNA, RNA," teachers are to "elicit student responses with these terms." This guidance assists teachers in gathering data from what students learned in previous grade levels to move forward. In addition, lesson guides provide informal assessments for teachers to gather data on student learning. For example, in the "Musical Chain Notes (Teacher)" located in "Unit B.6B Cell Differentiation Lesson Guide," the materials provide teachers the opportunity to gather data by encouraging "students to add any missing information and brainstorm with a partner to expand their language" to different prompts such as "Define DNA. What is the role of DNA in cell differentiation?"
- Materials include a Concept Mastery section, which includes a range of formative and summative assessments to assess student learning in various formats. The "Category 2 Concept Mastery" page shows that all lessons include a Formative Assessment 1, TEKS Video(s), a Vocabulary Assessment, and a Formative Assessment 2, each with a variety of TEKS-aligned questions types, such as multiple choice, fill in the blank, and multi-answer questions. Additionally, the "Assessment Bank" document on the "Dynamic Biology Teacher's Guide"

details that teachers may "create custom assessments for students" that include multiple choice, multi-select, drag and drop, short constructed response, multi-part, and text-entry questions, which are "all of the STAAR 2.0 item types" that students will see on their End of Course STAAR Test.

- Materials include diagnostic and summative assessments, including formal opportunities to assess student learning in various formats. For example, the "STAAR Biology EOC Practice Test" button located in the Biology EOC Review section on the course dashboard includes an "EOC Practice Test 2024," "Short Constructed Response Practice Items," "Vocabulary Boosters," "Pre-tests," and "Post-tests" per standard. The pre-tests include multiple choice questions such as "Which of the following options correctly describes a similarity between a bacterium cell and a plant cell?" The "STAAR Biology EOC Practice Test" includes 53 questions.

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

- Materials include Concept Mastery sections that assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment. For example, the "Unit B.7A DNA Concept Mastery" lesson has two formative assessments, a TEKS video, and a vocabulary quiz that indicate that they all assess student learning that is aligned to TEK B.7A, which expects students to identify components of DNA, explain how the nucleotide sequence specifies some traits of an organism, and examine scientific explanations for the origin of DNA. In Formative Assessment 1 for B.7A DNA, the breadth of the TEKS B7.A is covered as the assessment includes questions about DNA's structure, like "Which of the following are nitrogenous bases found in DNA," questions about the relationship of nucleotide sequence and traits in an organism, like "A gene is a specific sequence of nucleotides in a segment of DNA. What is determined by genes," and questions about the origins of DNA, like "What is stated by the RNA World Theory?" In addition, Content Mastery allows the teacher to create customized exams for specific TEKS, as it "Allows [teachers] to create custom assessments for students across the following parameters:
    - Length of the assessment (# questions)
    - Item types to be included: MC, MS, DD, SCR, MP, or Text Entry, or all at the ratio of 75% MC, 25% mix of the other item types
    - % (i.e., 40%) of dual-coded items to include
    - Specific TEKS to include on the assessment."
- Materials include lesson guides that cover all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment. For example, the "Unit B.7B Gene Expression Lesson Guide" clearly indicates that TEKS B.7B describes the significance of gene expression and explains the process of protein synthesis using models of DNA and ribonucleic acid (RNA), which will be assessed in all activities in the lesson guide. In this lesson guide, the breadth of the student expectations from TEKS B7.B is assessed through a variety of assessment opportunities, such as "Investigation- Modeling Gene Expression/Cell DIfferentiation," where "Students will work in groups to design a procedure to build a model that begins with a DNA sequence and ends with the protein for a specific cell."
- The materials include a Scope and Sequence in the "Dynamic Biology Teacher's Guide" for each unit that lists all assessments for the unit under Evaluate, therefore assessing all student expectations, as outlined in the TEKS. For example, "Unit B.7B Gene Expression Lesson Guide" provides Formative Assessment 1, Vocabulary Boosters, and Formative Assessment 2, indicating that these assessments directly assess B.7B.

Summit K12 Dynamic Biology

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

- Materials include Apply and Extend sections within the lesson guides, including assessments that integrate scientific concepts and science and engineering practices (SEPs). The Apply and Extend section occurs at the end of the lesson cycle after student learning to solidify ideas. For example, “Unit B.7B Gene Expression Lesson Guide” has an Apply and Extend section with an activity called “Investigation-Modeling Gene Expression/Cell Differentiation” that integrates the topic of transcription and translation with the “plan and conduct experimental investigations (SEP B.1B), organize qualitative data (SEP B.1F), and Develop and use models (SEP B.1G)” SEPs, as students “work in groups to design a procedure to build a model that begins with a DNA sequence and ends with the protein for a specific cell.” Additionally, the “Unit B.7B Gene Expression Poster Activity” also integrates the scientific concepts of protein synthesis with “SEP B.1A: Ask questions and define problems,” as students “create a poster showing protein synthesis, critique other group posters using a rubric and make corrections to their posters.”
- In addition, materials include “Interactives” that integrate scientific concepts and SEPs. For example, “Unit B.7B Transcription and Translation Interactive” integrates the scientific concepts of gene expression with the SEPs “Develop and Use Models (SEP B.1G)” and “Analyze, evaluate, and critique scientific explanations (SEP B.4A)” as students work to “model protein synthesis” in a simulation and answer analysis questions.
- Furthermore, materials include assessments integrating scientific concepts and science and engineering practices through investigations. For example, in the “Investigation-Structural Adaptations and Survival-Teacher” document located in the Teach and Discuss section of “Unit B.10B Lesson Guide," students “design the best ‘tool’ to represent a bird beak adapted to obtain food in an ecosystem in their state.” Students first research the chosen “ecosystem and birds to aid in beak design, using the Bird Beak Chart as needed.” Next, students “test the beak model under numerous environmental conditions and determine if the tool succeeds in native versus non-native ecosystems.”

Materials include assessments that require students to apply knowledge and skills to novel contexts.

- Materials include Apply and Extend sections in the lesson guides, including assessments requiring students to apply knowledge and skills to novel contexts. For example, the “Unit B.8B Outcomes of Genetic Combinations Lesson Guide” contains an Apply and Extend section with an activity called “Wrap it up Research Activity,” where students apply their knowledge of genetic crosses to the novel concept of “an autosomal or sex-linked recessive genetic disorder.” In another Apply and Extend activity, called “Investigation- Are All Punnett Squares Correct,” located in the “Unit B.8B Outcomes of Genetic Combinations Lesson Guide,” students apply their knowledge and skills of solving Punnett squares to “plan and conduct a comparative lab to determine the reliability of Punnett squares in predicting genetic traits.”
- In addition, materials include “Literacy Connection” activities in lesson guides, including assessments requiring students to apply knowledge and skills to novel contexts. For example, the “Literacy Connection” activity called “Soybeans and Genetic Engineering,” located in the “Unit B.7D Molecular Technologies Lesson Guide,” assesses student learning of molecular technologies, such as genetically modified organisms, by requiring students to complete “a research-based writing assignment about genetic engineering.”
- The materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem through virtual labs. In the “Unit B.13B Ecological Stability of Trophic Levels Lesson Guide,” students learn about matter cycling and energy movement through

trophic levels. The “What Role Am I Playing, Again?” activity asks students to apply their knowledge to a dynamic food web and predict outcomes. For example, the materials present students with the question, “A farmer used fungicide to kill all the fungi in the soil. How could this affect the stability of the ecosystem?” Students must apply what they learned about ecosystem stability.

Summit K12 Dynamic Biology

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 student's 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 student's needs, in all areas of science, based on measures of student progress appropriate for the developmental level. Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension. Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.

Evidence includes but is not limited to:

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

- Materials include embedded activities in the lesson guides that include information and resources that guide evaluating student responses in the form of scoring rubrics. For example, the "Unit B.7B Gene Expression Lesson Guide" contains an embedded activity called "Comic Strip" that requires students to "create a comic strip about protein synthesis" and "display their products for other student groups to observe and critique." The "Comic Strip-Teacher" document provides teacher instructions and a scoring rubric to evaluate student responses. On this rubric, teachers are guided to give a score of 4 if "all the facts in the comic strip are accurate," a score of 3 if "the majority of the facts in the comic strip are accurate," a score of 2 if "some of the facts in the comic strip are accurate," and the lowest score of a one if "minimal to none of the facts in the comic strip are accurate."
- Additionally, the "Unit B.7B Gene Expression Lesson Guide" contains a "Poster Activity" that includes a scoring rubric that guides evaluating student responses to an activity where students "create a poster showing protein synthesis, critique other group posters using a rubric and make corrections to their posters." In this activity, teachers are guided to provide students a score between 0–3 based on the following categories: "Identifies important information, questions, and focus on the task."
- Each lesson guide includes an "Engage" activity with suggested teacher actions to address student learning gaps. Each lesson guide provides an "Engage" piece to solicit student response.

For example, in Unit B.13A Lesson Guide, the "Engage" activity "Organisms in an Ecosystem" states, "If students do not remember the types of relationships or are not familiar with the scenario, explain that, as the lesson progresses, they will learn more about these relationships." In addition, "Engage" activities provide examples of acceptable answers for evaluating student responses. For example, in the "Engage" activity located in "Unit B.10C Speciation Lesson Guide," the teacher poses the following question to students: "Do you think that humans are still evolving?" Students discuss their answers with a partner, and the teacher calls on a few "students to share their ideas." The teacher then informs students "that scientists believe that humans are evolving through natural selection." The teacher then asks students, "Do you think that natural selection will cause a new human-like species to evolve in the future?" Teachers do not correct misconceptions but instead "allow students to share their explanations." The teacher clarifies, "that at this point, the class is exploring all possible ideas."

Materials support teachers' analysis of assessment data with guidance and direction to respond to individual student's 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 based on measures of student progress through the use of Science Reports located in the K12 Help Center. The types of reports include "Concept Boosters," "Vocabulary Boosters," "Process Vocabulary," and "Usage Report." For example, the materials state under the Vocabulary Boosters, "This report will give a class overview of the student's performance on the vocabulary boosters."
- Additionally, materials include an "Assessment Bank" document that provides support to teachers' analysis of assessment data to respond to students' individual needs. For example, the "Assessment Bank" shows a screenshot of a Concept Mastery assessment screen, showing that student scores are color-coded to show levels of mastery by skill (TEKS). A student that "masters" the assessment would have a green score, "meets" would have a blue score, and "approaches" would have a purple score, making data viewing easier for the teacher. The "Assessment Bank" document also provides information about how teachers can respond to the individual needs of their students by creating custom "assessments on demand using content and items students have never seen before."
- Materials include assessment tools that yield data teachers can easily analyze and interpret through "Personalized Learning Plans" found in the "Dynamic Biology Teacher's Guide" under the Differentiation and Acceleration section. The "Personalized Learning Plans" limit teachers to one assessment. The materials assess student progress to the TEKS and create a "Personalized Learning Plan" that lists the lowest-performing TEKS to the highest with a cutoff of "80%" mastery.
- The materials provide guidance documents and resources to support the teacher's interpretation of the data. For example, the "Concept Mastery" resource found in the "Dynamic Biology Teacher's Guide" guides online studying through the Concept Mastery Suite. The materials inform teachers that students cannot access Formative Assessment 2 until students "score at least 80% on the TEKS Vocabulary." The materials guide the teacher: "You may assign lower grade level vertically aligned scaffolds as needed to differentiate instruction." The "Reports and Dashboard" located in the Teacher Guide under teacher resources contains explicit information for accessing data reports for student progress. For example, the "Teacher Reports Dashboard" contains links for reports for "TEKS Lesson Videos," "Concept Mastery," "Vocabulary Master," and "Scientific and Engineering Practices."

Summit K12 Dynamic Biology

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

- Materials include an “Assessment Bank” document from the “Dynamic Biology Teacher’s Guide” that yields relevant information for teachers to use when planning instruction, intervention, and extension. For example, the “Assessment Bank” shows a screenshot of a “Concept Mastery” assessment screen, showing that student scores are color-coded to show levels of mastery by skill (TEKS) to allow teachers to organize student data to differentiate science instruction. The “Assessment Bank” document also prompts teachers “to customize the length, the TEKS to include, the number of items, the % of dual-coded items to include, and the item types based on student individual need.” The “Assessment Bank” will “automatically create class and student level reports” for teachers who create custom assessments, yielding relevant information to use when planning future instruction, intervention, and extension.
- Materials include a “Differentiation and Acceleration” document in the “Dynamic Biology Teacher’s Guide” explaining how information gathered from the assessment tools helps teachers plan differentiated instruction. For example, the “Differentiation and Acceleration” document contains an image showing color-coded student scores to help teachers organize student data and differentiate science instruction. Student scores are organized into red, purple, blue, and green categories (shown in the Assessment Bank document to represent the STAAR categories of Does Not Meet, Approaches, Meets, and Masters), with the comparison of student scores on the “pre-test” and “post-test.” The document states that students “must achieve >80% on the Vocabulary Boosters flashcards to unlock the Post-test,” yielding information for teachers to plan intervention for students who score below an 80% and extension for students who score above an 80%.

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

- Materials provide various resources and teacher guidance on leveraging different activities to respond to student data through direct instruction followed by models, investigations, activities, and literacy connections. For example, in the “Would You Rather” activity in “Unit B.5A Biomolecules Lesson Guide,” students practice their knowledge by justifying if they would rather be a protein or a nucleic acid. Students work in pairs, justify their response to their partner, then participate in a class discussion where the teacher is guided to clarify “any misconceptions held by the students.”
- Materials include Apply and Extend sections in the lesson guides, providing various resources and activities for teachers to respond intuitively to student data. For example, the “Unit B.7C Changes in DNA Lesson Guide” contains an Apply and Extend section with three different activities teachers can choose to use to respond to student data. In the “Comparing Mutation Types” activity, students “compare and contrast gene and chromosomal mutations and match vocabulary words with their definitions.” In a different activity, called “Are All Mutations Dangerous? Should I Be Worried,” students “extend their knowledge about genetic mutation disorders to determine if they are good or bad.” Additionally, the “Unit B.5A BiomoleculesLesson Guide” contains an Apply and Extend section with three activities related to the “structure and function” of biomolecules and an extended investigation in which students can “identify carbohydrates in unknown solutions.” This variety of resources and activities allows the teacher to have the autonomy to be the instructional decision maker as they respond to needs based on to student data.In addition, materials provide “Videos” for teachers to

illustrate concepts that students struggle to understand. For example, “Unit B.7A DNA Video 1” provides direct instruction on the scientific concepts of DNA structure and function, including embedded questions that teachers can choose or intuitively use to check for understanding. At 1:28, “Unit B.7A DNA Video 1” has the embedded question, “How would you describe the structure of DNA?,” for which teachers can intuitively choose to pause the video and let students discuss/pair share/answer individually. Guidance is provided for areas of support for students, but the teacher has the autonomy to be the instructional decision-maker and choose how to implement the various resources.

Summit K12 Dynamic Biology

Indicator 6.3

Assessments are clear and easy to understand.

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

Meets | Score 2/2

The materials meet the criteria for this indicator. Assessments are clear and easy to understand.

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

Evidence includes but is not limited to:

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

- Assessments contain scientifically accurate items, avoid bias, and are error-free. For example, “Unit B.7A DNA Formative Assessment 2,” located in Concept Mastery in Category 1, includes scientifically accurate questions, like “DNA is made of monomers called nucleotides. Which of the following statements is NOT true about DNA?” that are aligned with the Unit B.7A DNA Lesson Objective “Identify components of DNA, explain how the nucleotide sequence specifies some traits of an organism, and examine scientific explanations for the origin of DNA.” Additionally, questions on the “Unit B.7A DNA Formative Assessment 2” avoid bias by providing background information, like “DNA is a macromolecule that encodes biological information that makes each organism unique” that prevent student background from impacting student performance on the assessment. Lastly, “Concept Mastery” assessments, like the “Unit B.7A DNA Formative Assessment 2,” are free from errors in spelling/grammar, scientific terminology, and labeling of units.
- For example, the “STAAR Biology EOC Practice Test 2024” in the “STAAR Biology EOC Practice Test” button on the course dashboard is error-free and avoids bias. The assessment items give context and background information to students. For example, question 28 in the “STAAR Biology EOC Practice Test 2024” describes the hunt of bison to near extinction and asks students about genetic diversity. This question clearly outlines the concept of the question and the application of knowledge without bias.
- For example, the “Unit B.7B Gene Expression Study Guide” contains scientifically accurate review questions that are aligned with the lesson objective “Describe the significance of gene expression and explain the process of protein synthesis using models of DNA and ribonucleic

acid (RNA)." Additionally, questions in the "Unit B.7B Gene Expression Study Guide" avoid bias by providing an example of student expectation, such as "Describe one example of how the external environment of cells can affect gene expression. For example, excessive supplemental oxygen administered to prematurely born infants can cause permanent blindness" to help students from all backgrounds understand their expectations for the question. Lastly, all questions in the study guides, including the "Unit B.7B Gene Expression Study Guide," are error-free.

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

- Assessment tools use clear pictures and graphics that are developmentally appropriate. For example, the "STAAR Biology EOC Practice Test" includes pictures of cells in mitosis that align with student learning in the unit. Other appropriate item includes PCR, gel electrophoresis, and DNA sequence pictures without excessive detail that would overwhelm high school students.
- For example, question 5 on the "Unit B.7C Changes in DNA Formative Assessment 1," located in Concept Mastery in Category 1, contains a developmentally appropriate image of a deletion mutation that indicates the DNA bases and uses an arrow to show that these DNA bases are being removed from the overall strand of DNA. Additionally, question 9 on "Unit B.7C Changes in DNA Formative Assessment 1" contains a developmentally appropriate and clear image of the gene sequence on a "normal chromosome" and a "mutated chromosome" to help students identify "the chromosomal mutation that has occurred." In this image, the "normal chromosome" has a clear gene sequence of "1, 2, 3, 4, 5, 6, 7, 8," and the "mutated chromosome" has a clear gene sequence of "1, 2, 3, 4, 8, 7, 6, 5."
- For example, the "Apply" questions on the "Unit B.7C Changes in DNA Study Guide" contain a developmentally appropriate graphic of an "original" mRNA and amino acid sequence, along with five unidentified mutation graphics, to help students clearly "compare each segment to the original...then identify the type of mutation and its effect."

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

- Materials provide guidance to ensure consistent and accurate administration of assessment tools. For example, the "EOC Assessment Readiness Guide" in the "Dynamic Biology Teacher's Guide" summarizes the use, timeline, and STAAR Review plan before administration. The review guides teachers through the "EOC Diagnostic Practice Test" and outlines what the students' "Personalized Learning Plan" would look like.
- For example, the "Concept Mastery" document located under the Teaching and Learning section of the "Dynamic Biology Teacher's Guide" provides sample instructions, with labeled images, of a full lesson, with assessment built in. The "Concept Mastery" document provides teacher guidance on how to use E-posters to "Check for Background Knowledge and to Engage Students" as a form of assessment. Then, the Concept Mastery document guides teachers, with labeled screenshots of materials, to "Begin with Formative Assessment 1" to assess student knowledge. Then, it guides teachers to have students "Watch TEKS Video Lesson" before moving on to a "Vocabulary" assessment. After students "score at least 80%" on the Vocabulary assessment, teachers are guided to have students complete "Formative Assessment 2." The "Concept Mastery" document guides the teacher through the progression through Formative Assessment 1, the TEKS Video, Vocabulary Assessment, and Formative Assessment 2 to help the teacher efficiently administer assessments.

- For example, materials remind the teacher in the Evaluate section of each lesson guide the order of the assessments for students after they have completed learning material: “Students log into [program] K12 to master learning and assess understanding using the following components:
    - Formative Assessment 1
    - TEKS Video
    - Vocabulary Review
    - Formative Assessment 2.”
- Materials include detailed information supporting the teacher’s understanding of assessment tools and scoring procedures. All study guides have an associated “Key” that the teacher can access to see correct answers or sample student responses to questions. For example, question 10 of the “Unit B.8A Meiosis and Sexual Reproduction Study Guide” requires students to answer, “How does sexual reproduction contribute to genetic diversity?” The “Key” to the study guide provides teacher guidance for question 10, in the form of the sample student answer, “Genetic diversity occurs because crossing over between the homologous chromosomes allows the offspring to inherit a unique combination of genes,” to help ensure the consistent and accurate scoring of the study guide.

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

- Materials offer accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals. For example, the “Differentiation and Acceleration” guide in the “Dynamic Biology Teacher’s Guide” includes accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned with learning goals. For example, the “Differentiation and Acceleration” guide shows that three accommodations, “Digital Calculator, Content and Language Supports, and Text to Speech (TTS),” are provided to “students with an ARD and IEP.” It guides teachers by showing that they can enable these accommodations, or “designated supports,” by clicking the individual accommodation boxes next to the name of each student who receives the accommodation(s). In addition, the “Differentiation and Acceleration” guide includes teacher guidance for “Differentiation and Acceleration:
    - TEKS Vertically Aligned Scaffolds
    - Differentiated Science Literacy eBooks
    - Differentiated Science Writing Practice
    - Special Education and 504 Accommodations and Designated Supports
    - Second-Language Acquisition Support for all Emergent Bilingual Students
    - Acceleration
    - Accelerated Resources, Projects, and Extension Activities.”
- For example, the “Accommodations, Accessibility, and Designated Supports” document located in the “Dynamic Biology Teacher’s Guide” under “Course Design” shows the availability of the “text-to-speech (TTS)” function, built into the “Concept Mastery” assessments, in which students click on a play-button icon to listen to a digital text read aloud for any question or answer choice that they choose. Additionally, the document shows the availability of “content and language supports,” which look like blue boxes around a word. It shows that students can click on the blue box around the word with content and language support to get a pop-up box with an explanation or image. The document guides teachers to choose to enable either the “content and language supports,” the “text-to-speech,” or both accommodations for each

student based on student need by clicking on checkboxes next to each student's name to assign them the associated accommodation(s). In addition, the document states that some accommodation resources are "Calculation Aids - Digital Calculator, Content and Language Supports, Individualized Structured Reminders, Spelling Assistance, Supplemental Aids, Mnemonic devices, and Graphics and State Approved Formulas."

- For example, materials offer students a "Personal Learning Plan (PLP)." The product explains that as students master concepts, new lessons will unlock for them to complete. If students do not master a concept, a review lesson may open for students to complete before moving forward: "Why is my Science/Biology PLP asking me to 'Try Again' on an activity? You need to meet a passing score to move on to the next activity. Vocabulary Boosters: passing score is 80% Post-Test: passing score is 70% If you don't meet the passing score on the Post-Test after the 2nd try, your PLP may open a different, supporting lesson for you to work on instead."

Summit K12 Dynamic Biology

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

Materials provide recommended targeted instruction and activities to scaffold learning for students who still need to achieve mastery. Materials offer enrichment activities for all levels of learners. Materials provide scaffolds and guidance for just-in-time learning acceleration for all students.

Evidence includes but is not limited to:

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

- The materials include teacher guidance for scaffolding instruction and differentiating activities for students who still need to achieve mastery. For example, the “Concept Mastery” embedded support in the “Dynamic Biology Teacher's Guide” guides teachers to vertical alignment lesson guides targeting skills in previous grade levels. Concept mastery provides two formative assessments, with a video and vocabulary practice. The materials guide the teachers to begin with "Formative Assessment 1,” then watch the TEKS video “before starting Vocabulary.” Students must “score at least 80% on the ‘TEKS Vocabulary’ section for Formative Assessment 2 to unlock,” ensuring scholars master the chapter's vocabulary before assessing their mastery of chapter content.
- Materials provide recommended targeted instruction and activities to scaffold learning for students who still need to achieve mastery. For example, the “Unit B.7A DNA Vocabulary Mastery” activity allows students to practice vocabulary by applying terms to real-world scenarios. The Vocabulary Mastery activity provides students with a sentence stem, and students apply their content knowledge to fill in the blanks in each sentence. For example, students would have to identify, using an image and a sentence stem, that “adenine” is the correct answer to “In DNA, _____ forms a base pair with thymine through two hydrogen bonds.” This activity provides targeted instruction for the unit as students apply their content knowledge. It also offers scaffolded learning, using images and sentence stems, to support students who have yet to achieve mastery.
- The materials provide additional lesson activities for targeted instruction that include differentiated instructional approaches. For example, the “Unit B.7A DNA Lesson Guide” contains an Apply and Extend section with numerous activities that target instruction and

scaffold learning for students who have not yet achieved mastery. One of the activities, "Summarizing the Origin of DNA," allows students to "examine one of the theories of the origin of DNA" by creating a graphic organizer to summarize this theory. This activity provides a scaffold and targeted instruction for struggling students. In addition, the materials contain study guides that provide additional practice in developing skills for students that have not yet achieved mastery. For example, the "Unit 6.8B Energy Transfer and Transformations Study Guide" provides fill-in-the-blank key vocabulary practice and labeling stem for transformation processes and identification of conservation of energy or no conservation.

Materials provide enrichment activities for all levels of learners.

- The materials provide online enrichment activities and include a variety of real-world scenarios students can explore based on their interests in particular areas of science or community needs. The Biology Interactives on the course landing page include teacher and student activity guides with real-world applications. For example, in the "Animal and Plant Cell Interactive" in Biology Interactives, students must identify types of cells and justify their responses. The "Gene Expression Essentials Investigation (PhET)" provides extended learning for students who have mastered grade-level skills. For example, after participating in a lab for gene expression essentials, students extend learning by meeting a new goal: "To maximize the rate of transcription of the gene into mRNA."
- The materials provide enrichment activities that account for learner variability. For example, the "Unit B.7C Changes in DNA Lesson Guide" contains an Apply and Extend section containing three enrichment activities for all learners. In one of the enrichment activities, "Comparing Mutation Types," students compare and contrast gene and chromosomal mutations to enrich their understanding of various changes to DNA. This activity provides enrichment for all levels of learners as they practice unit skills and vocabulary. In addition, the Apply and Extend section in the "Unit B11.B Role of Enzymes Lesson Guide" allows students to explore the effect of new enzymes on the world. Materials direct students to the Ted-Ed video titled "How Designing Brand-new Enzymes Could Change the World" by Adam Garske. Students predict what will happen in the test tubes at the end of the video and discuss it with a thinking partner. Students then write a prediction and draw a diagram of the lab setup, and lastly, students answer guided questions designed to promote deeper thinking.
- Materials include additional resources that encourage exploration and application of course-level science knowledge and skills, including applying new learning to project-based learning. For example, the Unit 8.6C Behavior of Water Lesson Guide provides the project research opportunity, "Researching Water Property Phenomena," and states that "students will research to discover water's properties in unique phenomena. They will produce a product designed to share their discoveries." Materials give students the following prompt: "Water is essential for life on Earth. Its unique properties are used by living organisms for a variety of different functions. Some, such as the water strider, take advantage of the water's surface tension. Others, such as plants, use the combination of adhesion and cohesion for capillary action to transport water without the use of energy. These examples are just the beginning of water's use by living organisms. In this research task, you will find other examples of how these properties of water are used by living and nonliving systems."

Summit K12 Dynamic Biology

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

- The materials include Concept Mastery lessons and recommendations for just-in-time scaffolds to develop productive perseverance in learning. For example, the Reporting Category 2 Concept Mastery section provides two formative assessments, TEKS Videos, and vocabulary lessons to scaffold students for just-in-time learning acceleration. The formative assessments allow students to apply unit content knowledge on an exam. The TEKS Videos section will enable students to engage in a re-teach of unit concepts, and the Vocabulary section provides scaffolds for just-in-time learning acceleration as students apply their content knowledge. Teachers can decide which tools benefit each student from the concept mastery section.
- In addition, materials include "Study Guides" that provide scaffolds and guidance for just-in-time learning acceleration for all students. For example, the first page of "Unit B.7B Gene Expression Study Guide" guides students to practice unit applying vocabulary. The second page of the study guide builds on this and contains a scaffolded breakdown of protein synthesis, with sentence stems for students to fill in with vocabulary terms. The materials provide an additional scaffold, dividing protein synthesis into two steps (transcription and translation). This scaffold serves as guidance for the activity, where students apply their knowledge of protein synthesis to "use the DNA template to assemble a protein."
- The materials provide individualized learning plans for all students based on pre-assessment and formative assessments throughout the course. For example, a personalized learning plan (PLP) is customized for each student once they take the Biology End of Course (EOC) Practice Test or their first Formative Assessment located in the Concept Mastery section situated in Student Resources. Students then follow the plan independently and can accelerate their learning at key points to promote mastery of content.
- Materials include activities designed to promote just-in-time learning acceleration for students by having prompts and cues to use with learners when they are stuck on a particular task or unsure how to proceed. For example, the "Unit 8.6C Behavior of Water Lesson Guide" includes a jigsaw puzzle activity. Material directs students: "Your task is to 1) Develop quality research questions. 2) Identify the phenomena 3) Connect the phenomena to a property of water. 4) Explain how the water property affects the system."

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Indicator 7.2

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

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

Meets| Score 2/2

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

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

Evidence includes but is not limited to:

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

- Lesson guides include a variety of developmentally appropriate instruction approaches to engage students in the mastery of the content. Each lesson guide sets up instruction within a 5E lesson cycle that engages students differently with the content. In the “B.13D Environmental Change, Biodiversity, and Ecosystem Stability Lesson Guide” located in Reporting Category 5, the materials guide teachers to engage students with an infographic on carbon footprints and engage in discussion questions, “I See...I think...I wonder…” before students gain an authentic experience in exploring ecology concepts. The materials guide teachers to share in pairs and then the whole group as a class to explain their understanding of the exploration. Multiple activities scaffold learning throughout the lesson guide, including inquiry and data collecting investigations, online interactives, and researching real-world issues (sustainable cities, invasive species, pesticides).
- In addition, the lesson guides include connections to scientific concepts in real-world applications, opportunities for students to engage in inquiry-based learning activities, and authentic tasks in which students use tools to measure and collect data. For example, “Unit B.7D Molecular Technologies Lesson Guide” contains a variety of activities to engage students. At the

start of the lesson, students participate in an activity called “Crime Scene Classroom,” representing an authentic task that engages students in the real-world use of molecular technologies. Then, students complete graphic organizers, investigations, case studies, card sorts, and CER activities to engage with real-world applications of molecular technologies to achieve mastery of the content.

- The materials engage students in the mastery of the content through various instructional approaches, including video clips to introduce and reinforce specific science concepts. For example, in the Concept Mastery section for Reporting Category 3 in the “Student Materials,” students can engage in various activities to master “B9.A Evidence of Common Ancestry” content, including “Video B.9A - Evidence of Common Ancestry,” and “Formative Assessment B.9A-Evidence of Common Ancestry.” In addition, lesson guides include TEKS videos to introduce to students. For example, “UNIT B13.B Stability of Trophic Levels Lesson Guide” in Reporting Category 5 provides a TEKS video that uses clear and colorful models and graphics to explain trophic levels, matter cycling, and energy flow through ecosystems. The materials present real-world pictures of different ecosystems and diversity worldwide to students.

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

- The materials contain lesson guides that consistently support a variety of instructional groupings (e.g., whole group, small group, partners, one-on-one). For example, “Unit B.9A Evidence of a Common Ancestor Lesson Guide,” located in Reporting Category 3, contains an “Interpreting a Graph: Animal Diversity Over Time” activity where students interpret organisms' diversity over geologic periods. Students then respond to questions about animal diversity, analyze data using bar graphs, compare and contrast their observations based on data, and discuss results in small collaborative groups. Additionally, materials provide suggestions for small group or one-on-one practice and activities. For example, “Unit B8.12A Lesson Guide” in Reporting Category 5 delivers an “Engage and Review” activity that guides the teacher to “Pre-assess by showing students the following image. Have students discuss the energy flow in the ecosystem with their partners.” Materials also provide an opportunity for students to work in pairs. For example, the “Link it Up” activity in “Unit 8.13B Ecological Stability of Trophic Levels Lesson Guide” provides teacher instructions as follows: “1. NOTE: ecosystem cards require color copies. 2. Put students into pairs and give each pair one set of hexagon ecosystem cards.”
- In addition, the lesson guides guide teachers on when to use specific grouping structures. For example, in the “Unit B.13A Ecological Relationships and Ecological Stability Lesson Guide” in Reporting Category 5, the Engage section prompts the teacher to engage students in a whole class discussion. For example, the prompt states, “Do you agree that humans are predators whose behaviors and diets harm Earth's ecosystems?” and allow students to take a position. In a follow-up activity, “Investigating Ecological Relationships,” the materials guide the teacher to “put students in groups or allow them to choose” and give each student a role in “reading and identifying the relationship.”
- Furthermore, the “Unit B.8B Outcomes of Genetic Combinations Lesson Guide” in Reporting Category 2 contains a variety of activities with flexible grouping. At the start of the lesson guide, students participate in an “Engage” activity and participate in a whole-group class discussion regarding their observations and hypotheses for the phenomenon “What controls the characteristics that you see in each dog breed.” Later in the lesson, students work individually to complete an activity called “Literacy Connection-Ted-Ed Video Graphic Organizer,” as well as various monohybrid practice activities. Toward the end of the lesson, students will “work with their thinking partner to predict the possible outcomes of monohybrid and dihybrid crosses” in

an activity called “Punnett Square Trade-Off.” Students work, again, “in thinking pairs to write scenarios and work out Punnett squares” in an activity called “Draw One or Two.” At the end of the lesson, students work individually to complete an activity called “Genetic STEM Careers” to “investigate a genetics STEM career and present their information to the class.”

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

- Materials include lesson guides that consistently support multiple types of practices (e.g., modeled, guided, collaborative, independent) and provide guidance and structures to achieve effective implementation. For example, the “B.5B Prokaryotic and Eukaryotic Cells Guide” in Reporting Category 1 provides guidance and instructions to teachers through various activities. The activities include independent work and a think-pair-share in the “What Cell Am I?” Other activities suggest teachers form groups or pairs to quiz each other in the “Animal and Plant Cell” Interactives. Teacher guidance clearly outlines the goal for the student activity, “Theories of Cellular Complexity.” The materials state, “Students will work collaboratively to research and create a summary and visual on chart paper.”
- Additionally, the “Unit B.7B Gene Expression Lesson Guide” contains a Key Concept section that supports guided learning (Gene Expression Two Column Notes), modeled learning (Build a Model and Codon Practice), interactive learning (Interactive-Transcription and Translation), and collaborative learning (Literacy Connection- Analogy for Protein Synthesis). These activities include teacher guidance, such as teacher instructions and teacher notes, for effective implementation.
- Furthermore, the Engage section in “Unit B.9B Rates of Change in the Fossil Record Lesson Guide” prompts the teacher to display “Hello, Can You Hear Me?” to the whole group. The teacher then asks students to sequence the phones from the oldest to the newest. Students then discuss how phones evolved. Student pairs then reflect on the following statement: “Think of something that has changed in your city, town, or school.” The student groups draw a timeline of the events that led to this change. Then students decide if the changes occurred gradually over time or if they made an abrupt or sudden appearance. The teacher then calls on a few groups to share their timelines and ideas about how these changes transpired. As a whole group, they discuss the concept of change, not only in their lives but also in life on Earth, as documented in the fossil record.
- Lessons guides include teachers moderating student working groups to engage in scientific discussions and debates. For example, the “Unit B.12A Interactions Among Animal Systems Lesson Guide” in Reporting Category 4 provides an activity for students to discuss multiple topics for body systems and homeostasis. The materials state, “The teacher will set a two-minute timer while the students follow the procedure and address discussion questions. Students will pair up with a partner. They will discuss the following, ‘The body systems' names and functions on their tags’ and ‘How the two body systems interact to maintain homeostasis and perform the functions of regulation, nutrient absorption, reproduction, and defense from illness or injury’ and ‘The components of the body system, such as organs.’”

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

- Materials include Biology Videos representing diverse communities in the images and information about people and places. For example, Video 1 in “Unit B.7A DNA” contains images that reflect a diversity of gender, race, and ethnicity when describing the role of DNA in

providing unique traits. The Biology Video for "Unit 7.13A Functions of Human Body Systems" also provides a video covering body systems portrayed by individuals with many varied characteristics representing a diverse school community. Images reflect the diversity of school communities and match the content. Characteristics vary in images to include race and ethnicity, skin tone, gender identity and expression, age, disability status, body size, and shape and hair texture.

- Furthermore, materials include "Scientific and Engineering Practices" activities representing diverse communities in the images and information about people and places. For example, the "Investigate STEM Careers (SEP B.4C) Skills Companion" activity and the "Vocabulary" activity have images that display a diversity of races, ethnicities, genders, and careers. The "Investigate STEM Careers Vocabulary" activity shows a diversity of race and gender through the naming of "Juan" and "Sonia." Additionally, the "Investigate STEM Careers Skills Companion" activity displays diversity in careers as unique STEM careers. The activity provides examples such as "gaming engineer, volcanologist, and ethical hacker."
- Materials represent diverse communities using images that are respectful and inclusive. For example, each PowerPoint presentation in the lesson guides for Reporting Category 3 presents a female scientist on the first slide.

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Indicator 7.3

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- The materials include the " K12 ELPS Support" document located in the "Dynamic Biology Teacher's Guide," which provides guidance for linguistic accommodations (communicated, sequenced, and scaffolded) commensurate with various levels of English language proficiency as defined by the English Language Proficiency Standards (ELPS) and includes teacher guidance for communication with Emergent Bilingual (EB) students, to create comprehensible input. Materials provide multiple strategies for assisting EB students. Examples of support include "Internalizing Academic Language in Writing Activities," "Using Accessible and Essential Language," and "Learning Language Structures." In "Learning New Expressions," the materials guide teachers in creating comprehensible input by informing teachers that "students must hear and then use these new expressions, in context, in the classroom setting." A more specific example in the " K12 ELPS Support" document gives the following guidance to teachers for "Decreasing Linguistic Accommodation English Language Proficiency Standard (4. E.i): Students will read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned." Instructions for teachers continue, "When students begin to read English texts, they will likely require linguistic accommodations to understand the material. These can take the form of bilingual materials or text in different languages side by side; language-simplified materials rather than content-simplified materials; or standard materials that include bilingual or language-simplified glossaries or in-text definitions." The page directs the teacher to decrease the usage over time as the student progresses in ability.

- The materials include “Multilingual Newcomer Lessons” found in the “Science Literacy” section that embed scaffolds into lessons for EB students, such as visuals, gestures, sentence stems, graphic organizers, anchor charts, and manipulatives. The materials include a reading by topics and pictures, embedded chunked reading segments, and scaffolded questions and prompts. For example, the “Animals eBook” asks students to “Look at page 7,” and then students answer a question using a drop-down menu: “I see an animal with white ....” and they identify the part of the animal.
- The materials include “Lesson Guides,” which guide linguistic accommodations that suggest that teachers increase the wait time to allow for processing and production when requiring a written or spoken response. For example, the “Unit B.7C Changes in DNA Lesson Guide” contains an activity called “Changes in DNA Three-Column Notes” that guides linguistic accommodations for ELPS 2.I. and 4.D. In this activity, students “demonstrate listening comprehension” as they “record the main idea, details, and a memory clue or visual.” The instructions guide linguistic support: “Teachers should allow students time to record notes, repeat information, and rephrase or further explain confusing concepts.” Further explanation and guidance for linguistic support are provided later as the instructions detail that “this can be used as pre reading support to ensure comprehension before students complete individual reading assignments.”
- In addition, the “ELPS Correlation” spreadsheet on the “My Courses” page includes the ELPS, activities, page numbers, audience, and URL location for teachers to provide linguistic accommodations. For example, the “Description of/Location” section of the spreadsheet states the location of an activity that provides ELPS guidance, “B.9A Lesson Guide -- Under Key Concepts -- Gray Box ‘Homologous vs. Analogous’ -- Teacher Version.” Furthermore, the “ELPS Correlation” provide multiple opportunities for meaningful engagement with content, spiraling concepts and vocabulary for repeated practice, and using paraphrasing techniques for internalizations. For example, under “Teacher Notes” of the “Homologous vs. Analogous” activity in the “B9.A Lesson Guide” referenced in the “ELPS Correlation” spreadsheet, the materials state, “Ensure students are using their learning strategies as they share ideas with a partner. Teachers can model accountable talk or offer to rephrase the information. Students compare language pronunciation with peers and offer synonyms or related words. Students use new vocabulary to describe the pictures. Students should communicate with partners by sharing additional details and descriptions from the pictures and offer a signal to teachers, such as thumbs up or thumbs down, to demonstrate understanding. [ELPS] (1.D.i)(3.B.ii)(3.B.iii)."

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

- Materials encourage strategic use of students’ first language as a means to linguistic, affective, cognitive, and academic development in English through word lists and materials provided in multiple languages. For example, “The Science Foundations Newcomer Lesson Guide” provides materials for lesson support in English and Spanish. It offers a word list and study guide in Arabic, Burmese, Nepali, etc., for 11 languages. For example, the Arabic word list comes in a T-Chart of common “nouns,” “verbs,” and “adjectives.” The “Starting Up Worksheet” comes in translated languages and includes pictures, sentence stems, word banks, matching, and drawing.
- In addition, materials include “Science Cognates,” located in the “Science Literacy Vocabulary Mastery” section of the “My Courses” page that consists of a glossary or text boxes with cognates or definitions in second languages. The materials provide six sets for content practice and two “Cognate Lists” for vocabulary words. In addition, these materials allow students to

practice vocabulary in Spanish first by reading, listening, and speaking, allowing for linguistic, affective, cognitive, and academic development in English. For example, “Quiz Set 1” of the “Category SEPs” in the “Science Cognates” activities provide a word and a sentence in Spanish first and prompts students to record both in Spanish. The second question on “Quiz Set 1” prompts students to record the English cognate of the word and sentence previously provided in Spanish. For example, students must record the word “analizar,” and the sentence, “Es fácil analizar un problema cuando se tienen datos,” in question 1. In question 2, students record the word “analyze” and the sentence, “It is easy to analyze a problem when you have data,” in English.

- The materials include a “K12 ELPS Teacher Support” document located in the TEA Resources section of the “Biology Dynamic Teacher’s Guide” that provides tips for teachers about the importance of allowing students to express their understanding in their first language and practical suggestions for teachers who do not speak the student’s first language. For example, the “K12 ELPS Teacher Support” document suggests that teachers should judge the linguistic accommodations needed by each student but provide beginning-level EB students with “bilingual or language-simplified materials” to promote development in English. This document guides students to “read in both English and your first language or easier-to-understand English.”

Summit K12 Dynamic Biology

Indicator 7.4

Materials guide fostering connections between home and school.

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

Meets | Score 2/2

The materials meet the criteria of this indicator. Materials guide fostering connections between home and school.

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

Evidence includes but is not limited to:

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

- The materials provide information to share with students and caregivers about the program's design. Within the “Student Getting Started” guide in the “Dynamic Biology Teacher’s Guide,” the materials outline each embedded support available to students. For example, the guide displays the “Concept Mastery” page for Category 1. It explains, “As we explore new TEKS and concepts during the year, part of the evaluation process will include logging into this table to complete four activities...." The guide reviews “Concept Mastery,” “Science Literacy,” “SEPs,” and “STAAR Review.”
- In addition, materials include a “Parent/Guardian Letter” document in the “Dynamic Biology Teacher’s Guide” that provides information teachers can share with students and caregivers about the program's design. The “Parent/Guardian Letter” document introduces the program to parents and states, “The following documentation provides an overview of the program. Your child has been given login credentials to the [program] K12 online course.” Materials provide information to be shared with students and caregivers about the program's design. In addition, the letter states, “Dear Families, Our school has adopted new Science instructional materials from [program] K12. This online program is accessible from home and includes lesson videos, digital flashcards, study guides, animations, and assessments. If you have Internet access, your child can access [program] K12 from home and school to expand their understanding of science concepts and build strong foundations in Scientific and Engineering Practices.”
- The materials include online resources for students and caregivers to learn about the program's design. Furthermore, for example, the first page of the “Philosophy” letter outlines six claims about the design of the program:
    - 1. Scientific Inquiry is the Essence of Learning Science.

    - 2. Teachers are the key to success in Science Education.
    - 3. We believe in providing comprehensive support for all Texas students and sub-populations.
    - 4. Differentiation and Acceleration are the new normal.
    - 5. Learning Science Content through RLA is imperative.
    - 6. Vocabulary Mastery in Context is a Cornerstone of Successful Science Teaching and Learning.
- This letter continues with "Evidence and Reasoning," which backs up each belief. The letter is in a Microsoft document and could easily be translated into different languages with Google Translate and given to caregivers.

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

- The materials provide information to be shared with caregivers to help reinforce student learning and development through the "Home to School Connection" letters in the "Dynamic Biology Teacher's Guide." These printable letters connect to the learning targets for that week. For example, a letter covering "Unit B.9A Evidence of Common Ancestry" is available for caregivers. The letter states, "Dear Caregivers, Below are some resources to start conversations at home. Remember to log in to [program] K12 to view TEKS videos, quizzes, vocabulary boosters, and more!" In addition, the "Home to School Connection" letters also provide five extension activities for caregivers to review with students and include tips on how the caregiver can support the student's needs. The extension activities include "Key Points," "Conversations," "Activities," "Vocabulary," and "Picture Talk." For example, in the "Home to School Connection" letter for "Unit B.7A DNA," specific guidance is given to caregivers on how to reinforce students' learning and development with conversations such as "Talk to your student about how traits compare between individuals in the same versus different families," and "What causes the difference in traits between organisms?" Additionally, it details the "Key Points" of each lesson, such as "An organism's genetic traits, or characteristics, are determined by the specific sequence of its DNA nitrogen bases present on the nucleotides," so that caregivers can help reinforce student learning and development at home.
- The materials include a "Parent/Guardian Letter" to families explaining the program's objectives and how they can support student progress. For example, the "Parent/Guardian Letter" located in the "Dynamic Biology Teacher's Guide" shows an image of the program homepage and provides information, such as "Concept Mastery – Lessons, assessments, vocabulary, and practice to help students master each TEKS during the year" about the sections that "students will most likely be assigned work" for.
- The materials provide at-home activities for caregivers to help reinforce student learning and development, such as scientific texts. In "Differentiated Science Literacy," in "Science Literacy," students access eBooks from home that include vocabulary, key ideas, and practice. For example, in the "Differentiated Science Literacy" activity in Unit B.5B titled "A Scientific Name," students classify the traits of a fish, frog, and leopard in the pictures.

Materials include information to guide teacher communications with caregivers.

- Materials include a "Parent/Guardian Letter" in the "Dynamic Biology Teacher's Guide" that provides information to guide teacher communications with caregivers. The instructions state, "The attached letter is an example of one that you may send home to the parents or caregivers

of your students to introduce them to the [program] K12 Science resources. We suggest sending the letter below, as well as instructions for how to access the program from home, through the district's LMS or portal." In addition, the "Parent/Guardian Letter" provides information for teachers to share with caregivers, like "This online program is accessible from home and includes lesson videos, digital flashcards, study guides, animations, and assessments." Furthermore, the letter explains to caregivers how "students will most likely be assigned work in one of the following modules:

  - Science Videos and Simulations – Lesson videos for all of the TEKS
  - Concept Mastery – Lessons, assessments, vocabulary, and practice to help students master each TEKS during the year
  - Science Literacy and Vocabulary Mastery – A TEKS-based nonfiction literacy and vocabulary resource to help students master Science vocabulary and concepts
  - Scientific and Engineering Practices – Includes Science labs, field investigation videos, more advanced vocabulary flashcards, Science process skill lessons, and other inquiry-focused resources."

- The letter engages caregivers as partners in learning as it encourages caregivers to "Feel free to explore these areas with your child as they begin to use the Dynamic Science course from home. Your child's teacher will guide the areas the students should work on each week. We look forward to helping your student reach their full potential in Science this year!"
- The "Home to School Connection" letters in the "Dynamic Biology Teacher's Guide" include information to guide teacher communication about current learning objectives and invite ongoing communication and partnership between teachers and caregivers. For example, the "Home to School Connection" letter for "Unit B.7C Changes in DNA" implies a partnership with parents as it begins with "Dear Caregivers, Below are some resources to start conversations at home. Remember to log in to [program] K12 to view TEKS videos, quizzes, vocabulary boosters, and more!" In this way, this letter guides the teacher to communicate a partnership with caregivers to reinforce student learning and development.
- The letter engages caregivers as partners in learning as it encourages caregivers to "Feel free to explore these areas with your child as they begin to use the Dynamic Science course from home. Your child's teacher will guide the areas the students should work on each week. We look forward to helping your student reach their full potential in Science this year!"

Summit K12 Dynamic Biology

Indicator 8.1

Materials include year-long plans with practice and review opportunities that support instruction.

1	Materials are accompanied by a TEKS-aligned scope and sequence outlining the order in which knowledge and skills are taught and built in the course materials.	M
2	Materials provide clear teacher guidance for facilitating student-made connections across core concepts and scientific and engineering practices.	M
3	Materials provide review and practice of knowledge and skills spiraled throughout the year to support mastery and retention.	M

Meets | Score 2/2

The materials meet the criteria for this indicator. Materials include year-long plans with some practice and review opportunities that support instruction.

Materials include a TEKS-aligned scope and sequence outlining the order in which knowledge and skills are taught and built in the course materials. Materials provide clear teacher guidance for facilitating student-made connections across core concepts 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.

- Materials include a year-long scope and sequence to support instruction. For example, in the "Scope and Sequence and Pacing Guides" document, a cohesive scope and sequence is available, providing clear vertical alignment of the essential knowledge and skills taught in the course of the school year. A scope and sequence is available for each individual Texas Essential Knowledge and Skills (TEKS) and includes "Lesson Sections," "Activity," and "Time Allotment" sections.
- The scope and sequence outlines the order to deliver the TEKS and categorizes all content into reporting categories. Additionally, the materials provide teachers with a clear understanding of the amount of time needed for each reporting category and offer guidance to teachers to allot 50-minute class periods.

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

- Teachers can reference the table in the "Biology TEKS-SEPs-RTCs Crosswalk" document, which is a tool that outlines how each TEKS relates to a science and engineering practice (SEP).
- The documents provide clear teacher guidance to make connections between units or lessons. Materials include "Lesson Guides" that list the SEPs to address in each lesson and show clear teacher guidance to make connections between lessons. For example, the "Activity Air Pollution Monitor B.13C" provides clear teacher guidance to implement the SEP for developing and using models by having students draw and then "build a prototype of your best design." Additionally,

this Air Pollution activity provides clear teacher guidance to implement the SEP for analyzing and interpreting data by having students evaluate their "design based on its ability to meet your criteria." These two SEPS are connected in a future lesson called "Activity Curing Cancer B.6C," as students have to analyze and interpret data by "graphing the cell growth data table" and develop and use models by designing and drawing a "tumor extraction device."

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

- The materials provide spiraling support throughout the year. In addition to resources such as "Concept Boosters" and "EOC Reviews" to review content within the school year, materials include "Lesson Guides" that clearly outline "Spiraled Practice and Review Activities to Support Instruction."

For example, the *Unit B.7A DNA* Lesson Guide shows vertical alignment to the eighth grade TEK 8.13B, where students "describe the function of genes in determining inherited traits." Additionally, this Lesson Guide provides spiraling support by providing the teacher implementation guidance of "use the Interactive E-Poster for TEKS 8.13B to assess prior knowledge of the role of genes in inherited traits." Additionally, in unit B.12A: Interactions Among Animal Systems" lesson guide, under the "Spiraled Practice and Review Activities to Support Instruction" section, provides guidance for spiraling, "The Engage activity for TEKS B.6A, "Help, I Cut My Finger" can be revisited to reinforce the role of cells in defense from injury." as well as providing spiraling practice for students.

Summit K12 Dynamic Biology

Indicator 8.2

Materials include classroom implementation support for teachers and administrators.

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

Meets | Score 2/2

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

Materials provide teacher guidance and recommendations for use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning. Materials include standards correlations, including cross-content standards, that explain the standards within the context of the 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 use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning.

- Materials include a “Dynamic Science Course Overview” that provides teacher guidance and recommendations by showing how to locate and navigate all included materials. The material also provides guidance to teachers on how to use all included materials; for example, the ”Dynamic Science Course Overview” shows an example of how to implement each of the course materials in a lesson.
- In addition, under “Teacher Resources,” the materials include a “Dynamic Biology Teacher’s Guide” with embedded technology to “Course Design,” “Teaching and Learning,” “Scientific and Engineering Practices,” and “Additional Resources.” The “Additional Resources” section includes a “Teacher - Getting Started” embedded support which outlines where to find documents, add students, scaffold, and access materials. These materials support teachers in the first steps of using the materials.
- Each lesson guide includes guiding questions, a 5E lesson cycle, and key concepts to support the teacher in understanding how to use the materials. For example, the “Unit B.8A Lesson Guide” on Meiosis and Sexual Reproduction provides an overview of Unit B.8A and all materials

included. The lesson guides also direct the teacher to use specific resources and include embedded hyperlinks to readings, graphic organizers, and infographics for students to review and analyze. For example, the “Unit B.8A Lesson Guide” also offers suggestions on how to engage students with the “Meiosis and Sexual Reproduction Image PDF.”

- Furthermore, the material includes recommendations to enhance student learning. For example, the “Unit B.5D Viruses Lesson Guide” provides a summary of an activity titled “Viral Replication Jam.” The “Viral Replication Jam - Teacher” document makes the following recommendation, “You may want to allow students to get creative and add images or references from the video that allowed them to better remember the difference between the lytic and lysogenic cycles.”

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

- Materials include a “Dynamic Biology Teacher's Guide,” which includes cross-content connections to Texas Essential Knowledge and Skills (TEKS), English Language Proficiency Standards (ELPS), and science and engineering practices (SEPs). For example, the “Dynamic Biology Teacher's Guide” includes a hyperlink to a “Summit K12 ELPS Teacher Support” document that explains the ELPS in the context of the course.
- In addition, each lesson guide includes cross-content standard correlations to the TEKS, ELPS, and SEPs present within each lesson. The lesson guides also reference “Literacy Connections” within lessons that have an applicable cross-content literacy connection. For example, in Reporting Category 2, Lessons B.7A, B.7B, B.7C, B.7D, and B.8A all contain cross-content “Literacy Connections” but do not demonstrate or explain how these passages are cross-curricular.
- Another example is the "Building a DNA Model" activity within the “Unit B.7A DNA Lesson Guide.” Materials provide standard correlation for each SEP and ELP that is within this activity. Furthermore, materials include a “Biology Cross Curricular Spiraling Document” that provides standard correlations, including cross-content standards that explain the standards within the context of the course. For example, in B.6A, the materials provide a Literacy Connection by providing an Acrostic Poem activity for students (E1.10A).

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

- Materials include a comprehensive list of all equipment and supplies needed to support instructional activities. Materials reference a “Materials List and Lab Inquiry Kits” within the “Dynamic Biology Teachers Guide.”
- In addition, each lesson guide provides a “Materials List” with embedded support under the “Resources” section on the first page. Furthermore, the materials include a comprehensive list of all equipment and supplies needed to support instructional activities found in the Biology Teacher's Guide within the “Teacher Resources.” The “Materials Lists and Lab Inquiry Kits” arranges the materials and resources required by TEKS. For example, the “Osmosis Lab” requires ”plastic wrap,” “marker,” and a “balance.”

Summit K12 Dynamic Biology

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

- Materials include a three-page “Science Safety Contract” located in the “Dynamic Biology Teacher’s Guide” under the “Science and Engineering” section. Although these materials do not include teacher guidance for safety practices or age-appropriate use of laboratory equipment, they do provide student guidance to safety practices and age-appropriate use of laboratory equipment. For example, the “Science Safety Contract” provides student guidance on how to carry scalpels in the classroom. The safety statements also include proper behavior during class and wearing the appropriate Personal Protective Equipment (PPE).
- Lesson guides provide embedded support documents for both the teacher and student for “Investigations.” For example, the “Shedding Light on Starch Investigation-Teacher” document provides teacher guidance on how to prepare solutions and provides general safety instructions, such as “wear safety goggles.” In addition, the materials include teacher guidance for safety practices and grade-appropriate use of safety equipment during investigations. For example, the “Strawberry DNA Extraction - Teacher” document located within the lesson guide for Unit B.7A in Reporting Category 2 includes the following statement “Safety Precautions: Do not eat or drink anything, including strawberries, in the laboratory.”

Summit K12 Dynamic Biology

Indicator 8.3

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

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

Meets| Score 2/2

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

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

Evidence includes but is not limited to:

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

- The materials include support for specific scheduling for 50-minute class sessions. The introduction section in the “Year at a Glance” advises that “The Summit K12 pacing materials are intended to assist educators in planning and organizing” and that “actual times will vary depending on scheduling considerations, the number of students, the amount of setup done ahead of time, the depth of class discussions, and your own needs and preferences.”
- The materials include guidance and recommendations on the required time for lessons and activities. For example, the “Disruptions of the Cell Cycle Lesson Guide” located in Reporting Category 1 has a time frame for the activities or lesson components. When selecting the writing activity, the updated scope and sequence does specify a time frame. The “Scope and Sequence and Pacing Guides” offer guidance and recommendations for timing instructional activities. This guidance includes suggested time allotments, in minutes or days, for all activities within a category. For example, the “Scope and Sequence and Pacing Guides” suggests a time allotment, in minutes or days, for each activity and lesson in Unit B5.A.
- The materials feature “Investigations” that provide guidance and recommendations for variability in timing within the investigation activity. For example, the Unit B7.D Investigation, “Mystery Colors Gel Electrophoresis Lab,” provides instructions for conducting both a 45-minute and a 90-minute version of the activity.

Summit K12 Dynamic Biology

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

- The materials provide guidance for strategic implementation that ensures the sequence of content is taught in an order consistent with the developmental progression of science. The materials provide a suggested sequence of units that considers the interconnections between the development of conceptual understanding. The materials purposely group standards together that have similar recurring themes and ideas, making it easier for students to connect scientific knowledge. For example, in Reporting Category 2, students cover DNA, gene expression, then changes in DNA located under buttons: “My Courses / Biology Videos and Interactives / Category 2 - Biology Videos RC2.”
- In addition, the “Scope and Sequence and Pacing Guides” guide the strategic implementation of content by outlining a suggested sequence of content, considering connections between the development of skills and understanding. For example, the Pacing Guide shows that students learn about fundamental concepts, like biomolecules, before they learn more complex material, like DNA structure and gene expression.
- Furthermore, the “Scope and Sequence and Pacing Guides” states that the material provides “an optional year-long pacing guide for schools and districts who wish to follow a set lesson progression that ensures all TEKS are covered within one school year. Within this framework, all grade level TEKS are organized into reporting categories with suggested time allotments for each TEKS.” This guidance allows for strategic implementation and allows content to be taught in an order consistent with the developmental progression of science.
- The materials in Reporting Category 4 suggest a sequence of TEKS B.11A, B.11B, B.12A, and B.12B with spiraling standards from prior grade levels 6–8 to show the connection of vertical alignment and support the progression and understanding of learning concepts.

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

- Materials designated for the course provide flexibility and can be completed in one school year. For example, the “Scope and Sequence and Pacing Guides” states, “Only 150 days are accounted for out of the 180 school days,” though this course includes more than enough material to cover the full 180 days of instruction. This schedule was intended to account for beginning-of-year logistics, STAAR review, district and state testing, field trips, or any other interruption to the daily cycle of instruction. Pacing should be adjusted according to student assessment data and district instructional priorities.

In addition, the “Scope and Sequence and Pacing Guides” material suggests extending past the required 150 days of materials by providing guidance on the use of the “Introduction to Science” to support the development of science and engineering practices (SEPs) before beginning instruction. At the beginning of the “Scope and Sequence and Pacing Guides,” guidance is given for optional extension STAAR Review beyond the 150 days outlined in the Pacing Guide. Materials provide a pacing guide for the implementation and timing of these extension activities that fill the remaining instructional days.

Summit K12 Dynamic Biology

Indicator 9.1

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

1	Materials include an appropriate amount of white space and a design that supports and does not distract from student learning.	Yes
2	Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting.	Yes
3	Materials include digital components that are free of technical errors.	No

Not Scored

The visual design of materials is somewhat 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 some digital components that are not 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 PowerPoints with appropriate white space and a design that supports and does not distract from student learning. For example, the “Unit B.7A DNA PowerPoint” in Category 2 of the “Teacher Resources” has slide titles that are large, prominent, clear, and located at the top of each slide. Content-related text in each slide is appropriately sized for student viewing. Content-related text aligns with the main subject of “DNA” and is organized in a logical progression. Each PowerPoint slide has consistent margins and empty spaces, a limited number of fonts, font sizes, and font colors to make content easy to read and comprehend.
- In addition, materials include “Videos” with an appropriate amount of white space and a design that supports and does not distract from student learning. For example, the “Unit B.7C Changes in DNA Video 1” in Category 2 of the “Teacher Resources” contains an audio and visual lesson that follows along through a PowerPoint. At 0:34 seconds, the video shows a large and purple PowerPoint slide titled “DNA Mutations,” which makes it clear and prominent amongst other text. Content-related text about mutations is appropriately sized below the title in black font to make it less prominent. An image is shown that is large enough for student viewing of important details. At 1:32, the video shows the vocabulary words “chromosomal mutation” and “gene mutation” in bolded text for emphasis, with an unbolded definition directly underneath the vocabulary word. Videos are organized logically, with each slide containing appropriate white space to support student learning.
- Student materials are appropriately designed to support student learning. For example, in “Unit B.10B Differential Reproductive Success Formative Assessment 1,” located in Category 3 of Concept Mastery, the ten-question quiz has an appropriate amount of white space with black and blue lettering that does not distract from student learning. Question 1 states, “Organisms

better adapted to their environment are described as having increased fitness. Which of the following statements describe fitness? Select TWO correct answers," in black letters.

- Teacher guidance materials are appropriately designed with clear, designated places for important information. Each lesson guide includes clear headings and one font and uses color-coded callout boxes to separate content to easily access materials for planning and implementation. For example, "Unit B12.A Interactions Among Animal Systems Lesson Guide" located in Category 4 provides a guide with a clear, appropriately sized white title on a blue background that makes it easy to find the appropriate lesson. Each section of the guide is differentiated with white or gray boxes with subtitles for "Student Objective," "Engage," "Teach and Discuss," "Apply and Extend," and "Evaluate," allowing teachers to find the appropriate material to plan the lesson and meet the student objective. In addition, each activity in the lesson guide includes embedded support in underlined blue font.

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. For example, the "Unit 6.12B Predatory, Competitive, and Symbiotic Relationships Vocabulary" activity located in Category 5 of Concept Mastery uses a photograph of a shark swimming near the ocean floor with remora fish attached to support the question presented to the student: "Remora fish use sharks for transportation, and the shark is left unharmed. This kind of relationship is called _____." These representations did not include excess pictures and contained easily identifiable components of each.
- In addition, materials include PowerPoints that embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. For example, the "Unit B.7B Gene Expression PowerPoint" in Category 2 in Teacher Resources contains many images that support students' understanding of the processes of transcription and translation. Slide 15 shows a large image of the translation process, spanning the entire slide. In this image, the "Ribosome, codon, tRNA, Amino Acids, mRNA, and anticodon" are labeled for students to view. The image is clear, colorful, and neat enough for students to gather all the necessary information without being distracted.
- Furthermore, materials include "Interactives," which include age-appropriate pictures and graphics that support student learning and engagement. For example, "Unit B.7B Gene Expression Transcription and Translation Interactive," located in Category 2 of the Biology Videos and Interactives, contains an age-appropriate graphic of DNA being turned into mRNA during transcription. The nitrogenous bases are color-coded in this graphic for easy student viewing and interaction. Graphics allow students to "drag the amino acids from the codon table below" to create a polypeptide chain. At the end of the interactive, the student-made DNA, mRNA, and polypeptide chain are shown together in order of protein synthesis to support student learning of the processes involved in creating proteins.

Materials include digital components that are free of technical errors.

- Materials include some digital components that are free of technical errors. For example, the "Unit B.7A DNA Study Guide" located in Category 2 in Teacher Resources requires students to answer twelve review questions, like "What three components make up a nucleotide?" All review questions are free from spelling, grammatical, and punctuation errors. All materials

included in the study guides contain accurate content and information for students to review. The “Keys” to the “Unit B.7A DNA Study Guide” contain entirely correct answers to review questions, such as “A ___Gene___ is a segment of DNA that influences a particular trait.”

- In addition, Content Mastery activities contain no grammatical errors, wrong answers, or inaccurate content. For example, in the “Unit B13.C Carbon and Nitrogen Cycles Vocabulary” activity, located in Category 5 of Concept Mastery, “Forests can experience damage from acid rain, which weakens trees because of soil nutrient imbalances.” Furthermore, “Unit B.7C Changes in DNA Formative Assessment 1,” located in Category 2 of Concept Mastery, contains ten assessment questions that are free from spelling, grammar, or punctuation errors. All questions contain relevant and accurate information, and the auto-generated grading tool is error-free.
- However, all vertically aligned scaffold lessons in all reporting categories contain digital components that are not free of technical errors. For example, the link to the PowerPoint for “Unit 8.6C Behavior of Water” in Category 4 in Teacher Resources is broken, and the PowerPoint cannot be accessed. Another example is the PowerPoint link for “Unit 7.12A Flow of Energy in Trophic Levels” in Category 5 in Teacher Resources. The link is broken, and materials cannot be accessed.

Summit K12 Dynamic Biology

Indicator 9.2

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

1	Materials integrate digital technology and tools that support student learning and engagement.	Yes
2	Materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific content.	Yes
3	Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate.	Yes
4	Materials integrate digital technology that is compatible with a variety of learning management systems.	Yes

Not Scored

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

Materials integrate digital technology and tools that support student learning and engagement. Materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific content. Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate. Materials integrate digital technology that is compatible with a variety of learning management systems.

Evidence includes but is not limited to:

Materials integrate digital technology and tools that support student learning and engagement.

- Digital technology and tools enhance student learning through such features as learning games, interactives, simulations, and online assessments. In the “Biology Interactives” in Biology Videos and Interactives, teachers assign interactives and virtual labs to students for each reporting category. For example, the “Unit B.7C Mutations Virtual Lab” enhances student learning through an interactive simulation of “substitution, addition, and deletion” mutations. This interactive supports student learning and engagement by allowing students to choose the location, frequency, and type of mutation that will impact the DNA strand provided. The “Scope and Sequence and Pacing Guide” document located in the “Biology Dynamic Teacher’s Guide” includes teacher guidance in the form of a timing suggestion of 20 minutes for the “Unit B.7C Mutations Virtual Lab” to support student learning with the interactives.
- In addition, materials provide “Vocabulary Mastery” for each reporting category and Texas Essential Knowledge and Skills (TEKS) unit. For example, “Unit B.13A - Ecological Relationships and Ecological Stability Vocabulary Mastery” provides practice for students to master eleven key scientific vocabulary words, which will assist students with mastery of Unit B13.A. Materials present student with a sentence with a keyword missing along with an engaging photograph related to the sentence. Students choose from a drop-down menu their response to complete the sentence.
- Furthermore, materials provide online formative assessments in Concept Mastery, including multiple choice, multiple select, and drag-and-drop questions. For example, in “B13.A Formative

Assessment 1" in Category 5, question 5 allows students to drag and drop vocabulary to descriptions. Student digital components include embedded tools, such as note-taking, variable font size, text-to-speech, dictionaries, glossaries, annotations, highlighting, and editable forms. For example, the formative assessments include text-to-speech, notes, highlighting, and bookmarks at the top of the page.

- In addition, materials include "Interactive E-Posters" for each TEKS unit, including embedded tools. For example, the "Unit B.7B Gene Expression Interactive E-Poster" in Category 2 enhances student learning of transcription and translation by providing a toolbar for students to annotate the interactive e-poster. This toolbar allows students to use tools, such as a "pen, sticky note," and highlighter, to help engage students in reviewing material presented on the interactive E-poster.

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

- Materials provide interactive simulations and models for students to explore scientific and engineering practices in a virtual environment. Virtual labs in the "Biology Interactives" in Biology Videos and Interactives allow students to manipulate models, gather information and data, and conclude. For example, the "Photosynthesis Virtual Lab" allows students to manipulate conditions, such as gasses and colors of light, to observe outcomes and collect data. The materials provide instructions to the lab within Category 4, "Unit B.11A Lesson Guide." The lesson guides per content TEKS include the science and engineering practices (SEPs) for each activity and list the recurring themes at the bottom. For example, the "Photosynthesis Virtual lab" incorporates SEPs B.1E, B.1F, and B.3B. Additionally, "Biology Interactives" include interactive simulations that support student engagement with SEPs. For example, the "B.7B Gene Expression Transcription and Translation Interactive" integrates SEPs B.1G and B.4A with course-specific content of transcription and translation as students work to digitally "model protein synthesis to understand the processes of transcription and translation." Student engagement is supported with the "B.7B Gene Expression Transcription and Translation Interactive" as students work to fill in missing information on a digital simulation to model the process of protein synthesis.
- Materials provide opportunities for students to obtain, evaluate, and communicate information using digital tools in the lesson guides. For example, the "Unit B.7A DNA Lesson Guide" in Category 2 contains an activity called "Researching the Origin of DNA" that integrates digital technology to allow students to "read a research article to examine evidence on the origin of DNA and write a reflection," with the SEP B.4B. In this activity, student engagement is supported as students use digital technology to "relate the impact of past and current research on scientific thought."

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

- Materials integrate digital technology that supports student-to-student collaboration. For example, the virtual labs in "Biology Interactives" located in Biology Videos and Interactives provide opportunities for student collaboration by engaging in content, discussing observations, and forming conclusions. The "Unit B.5B Prokaryotic and Eukaryotic Cells Lesson Guide" for the "Animal and Plant Cell Interactive" states, "Students could form groups to provide functions and

justify their answers" and "Students could also form pairs to quiz each other before clicking on the function of specific organelles."

- For example, materials include digital flashcards for each TEKS unit in "Vocabulary Mastery," located in "Science Literacy," which provides an interactive where students may complete in pairs for collaboration. According to the "Vocabulary Mastery Biology" PDF located in the "Dynamic Biology Teacher's Guide," the pictures on the vocabulary cards will dynamically change as students practice the sets repeatedly.
- For example, the "Unit B.8B Outcomes of Genetic Combinations Lesson Guide" contains an activity called "Literacy Connection-TED-Ed Video Graphic Organizer" in which students "watch a TED-Ed video to familiarize themselves with patterns of inheritance" and engage in a discussion about the video with a "thinking partner." Then students can work with their thinking partner to "predict the outcome of a monohybrid cross" based on the patterns of inheritance that they observed in the video.

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 "Support" tab at the top of the course dashboard links to the publisher's website. The publisher's website includes an article titled "Technical Specifications" under the "Onboarding & Integrations" button that states the program "WORKS ON ALL MAJOR PLATFORMS," including "iPads, Laptops, PCs, MacBooks, and Chromebooks." The "Technology Specifications for Best Usability" chart included in the article states, "[program] K12 provides an online supplemental curriculum that is 100% web-based (HTML5) and requires no special software installations." The publisher cautions, "Our courses can be accessed using most major hardware platforms and web browsers. While Android Tablets and Phones can access our LMS on a web browser, not all features are fully supported." There is a hardware list "for the best usability." The chart also lists the "minimum system requirements" for the "hardware, operating system, and browsers" on PCs, Macs, Chromebooks, and iPads to access digital materials. For example, the minimum system requirements for the browser for PC are listed as "Internet Explorer 9, 10, and 11, Firefox 10.x and 18+, Chrome 24+, Mac - Safari 4.1+, Firefox 10.x and 18+, Chrome 24+, and Chromebook - Chrome 24+."

Summit K12 Dynamic Biology

Indicator 9.3

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

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

Not Scored

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

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

Evidence includes but is not limited to:

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

- The digital technology and online components are developmentally appropriate for the course. For example, the embedded support Philosophy section in the "Dynamic Biology Teacher's Guide" explains "students learn science by observing phenomena, asking questions, conducting investigations, and using scientific practices" and includes "virtual labs and simulations," "science lab videos," and "virtual Texas field investigations." The materials provide a rationale, "The curriculum is designed to be delivered in flexible instructional models," and include the use of "interactive digital flashcards for practice and mastery of vocabulary" and "science literacy eBooks."
- For example, the "Videos and Interactives" document located in the "Dynamic Biology Teacher's Guide" provides a rationale for how the online "TEKS Videos" and "Biology Interactives" are developmentally appropriate because they "bring Science to Life" and "engage students and give students 24/7 access for review or if they miss school." The videos are further detailed to be developmentally appropriate and align with the scope and approach to science knowledge and skills progression because they include "100% of the Biology Content TEKS and SEPs."
- The digital technology and online components are aligned with the course scope and approach to science knowledge and skills progression. The lesson guides, found in each reporting category under "Teacher Resources," provide the Texas Essential Knowledge and Skills (TEKS) first, then the title. The lesson guides provide the English Language Proficiency Standards (ELPS) and science and engineering practices (SEPs) per activity and list all the ELPS and SEPs at the bottom.

For example, the investigation “Modeling Cell Differentiation” in the “Unit B.6B Cell Differentiation Lesson Guide” includes SEP B.1A, SEP B.2A, SEP B.3A, and ELPS 4.D.i.

- In addition, the materials include a “Scope and Sequence and Pacing Guide” document on the “Dynamic Biology Teacher’s Guide” that outlines how 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 scope and sequence state, “[Program] K12 has developed an optional year-long pacing guide for schools and districts who wish to follow a set lesson progression that ensures all TEKS are covered within one school year. Within this framework, all grade-level TEKS have been organized into reporting categories with suggested time allotments for each TEKS. Each lesson guide includes key concepts, investigations, and activities to facilitate quality instruction for all learners.” For example, the “Table of Contents” of the “Scope and Sequence and Pacing Guide” outlines the TEKS for each “Reporting Category” with an associated page number for each TEKS lesson. The “Scope and Sequence and Pacing Guide” shows a detailed pacing guide related to TEKS B.7B and suggests a sequence and timing for all materials, including digital “TEKS Videos” and “Interactives.”

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, digital materials provide a “Teacher Guide - Getting Started with [program] K12” under the “Using [program] K12 - Teachers and Administrators” section within the “Support” button at the top of the course page that provides teacher guidance for setting up and using technology. The website states the following: “After selecting ‘Concept Boosters,’ navigate to the bottom of the page titled ‘Teacher Accelerated Instructional Resources’ and select one of the icons for Reporting Categories 1–5 to view the online resources we offer. The resources may open in another tab or window.”
- For example, the “Videos and Interactives” document guides teachers to use online video components for “substitute teachers to continue the lessons, students who miss class, and for reviews.” Additionally, this document details how teachers “can preview TEKS lesson videos to learn and grow professionally” to continue to develop their skills and knowledge to enhance student learning. This “Videos and Interactives” document also provides clear instructions and tutorials, in the form of labeled screenshots, that detail how to access digital materials and use embedded technology.
- The materials provide specific teacher guidance for embedding the technology within lessons and assessments. The “Dynamic Biology Teacher’s Guide” in Teacher Resources provides an extensive summary of the use of embedded technology to support and enhance student learning. For example, the Concept Mastery support section provides detailed steps to use the Student Study Guides, Formative Assessments, Assessment Bank, TEKS Video Lessons, TEKS Vocabulary Mastery, and Interactive e-Posters. The materials guide teachers using the formative assessments and state, “During a Unit of Study, students will be assigned online practice.” The materials then provide detailed pictures for finding and assigning the embedded support.

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

- Materials are available to parents and caregivers to support student engagement with digital technology and online components. For example, digital materials include “Parent/Guardian

Letters" located in the "Dynamic Biology Teacher's Guide" under Teacher Resources that are available to parents and caregivers to support appropriate student engagement with digital and online components. The "Parent/Guardian Letters" document details to caregivers that the "online program is accessible from home" and tells caregivers that they can support student engagement with online components "If you have Internet access, your child can access [program] K12 from home as well as school to expand their understanding of science concepts and build strong foundations in Scientific and Engineering Practices." The "Parent/Guardian Letters" document provides further guidance to caregivers by providing verbal and pictorial "instructions below to access [program] K12."

- In addition, materials provide "Home to School Connections" letters located in the "Dynamic Biology Teacher's Guide" under Teacher Resources for each reporting category that can be sent home to parent caregivers by the teacher. For example, the "Reporting Category 5 Home to School" letter identifies the TEKS unit and title for study, such as "B.13B Ecological Stability of Trophic Levels" and continues with "Dear Caregivers, Below are some resources to start conversations at home. Remember to log in to [program] K12 to view TEKS videos, quizzes, vocabulary boosters, and more!" The letter continues and lists "Key Points" of study for the unit, "Conversations" parents could have with their student, "Activities" scenarios they can complete with their student, "Vocabulary" student will need to know, and "Picture Talk" which asks the caregiver to "talk about what is happening in the image above. Ask your student to explain each step."