Cengage Learning National Geographic Biology, Texas Edition

Cengage Learning National Geographic Biology, Texas Edition 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 some 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.

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 to develop grade-level appropriate scientific and engineering practices (SEPs) as outlined in the TEKS. Materials use phenomena to connect content standards to engineering practices. For example, the Unit 1 Overview, located in the Teacher's Edition Materials, guides teachers on how to develop, practice, and demonstrate mastery of the SEPs as outlined in the TEKS. Additionally, the unit Anchoring Phenomenon, "Sea Pig Survival in Deep-Sea Ecosystems" guides the teacher to "leverage the sea pig prompt within each chapter to connect concepts back to the unit's Driving Question, supporting students in gathering evidence and asking their research questions so they are equipped to complete the unit activity." These opportunities allow students to develop and practice SEPs before demonstrating mastery at the end of the unit.
- The materials provide students with multiple opportunities to practice grade-level appropriate SEPs. Materials contain an Inquiry Hub in each unit, including investigations and chapter performance tasks. For example, in the Unit 1 Inquiry Hub, "Investigation B: A Medicine Distribution Solution" supports students by guiding them through the SEPs. It has a prompt,

"Investigation Question, Your Challenge, Define the Problem, Plan (organized by day), and Analysis and Conclusions." For example, students are asked to "identify the constraints," and the text then defines constraints for the student.

- Materials provide opportunities for students to refine a model or explanation and ask questions that can be answered using data gathered by others. For example, Chapters 5, 6, and 7, "Looking at the Data" activities "Digestive Enzymes and pH," "Microbiota of the Human Body," and "Identifying Gene Mutations in Cancer Cells" all provide opportunities for students to develop, practice, and demonstrate mastery of SEP 4 "analyzing and interpreting data to develop evidence-based explanations." In Chapter 5, "Looking at the Data" activity, students are shown a graph of enzyme activity at various pH levels. Students must organize and interpret data to create an evidence-based design. Similarly, in Chapter 6, "Looking at the Data" activity, students are shown a data table and asked to develop an evidence-based conclusion based on the data interpretation.
- The materials provide investigations where students have multiple opportunities to show mastery of grade-level appropriate SEPs. For example, on page 361 of the *Custom eBook HS Biology, Teachers Edition TX*, "Investigation B – Mapping Fruit Fly Gene Through Linkage" allows the opportunity to practice and show mastery of TEKS SEP 2.B. In addition, the materials contain "Chapter 11 – Regulation of Gene Expression Lab," where students will analyze data from experiments and ask questions to reach a conclusion covering 2.B and 3.A.C.
- Materials outline when specific SEPs are spiraled back into the course after being introduced. Each chapter contains a "Tying it all Together" activity that allows students to engage with SEPs multiple times and in multiple contexts. For example, the Chapter 5 "Tying it all Together" activity "Turning Molecules into Medicine" allows students to develop, practice, and demonstrate mastery of the SEP skills to gather evidence and develop evidence-based explanations. In addition, Chapter 6, "Tying it all Together" activity "Artificial Cells and Technology," allows students to develop, practice, and demonstrate mastery of the SEP skills to analyze the problem and evaluate solutions.
- Furthermore, the materials allow students to know the contributions of scientists and recognize the importance of scientific research and innovation for society. For example, the Chapter 7 "Tying it all Together" activity "Immortal Cells: The Story of Henrietta Lacks" builds off of the prior two chapters by allowing students to practice the SEP skills to gather evidence and present their findings of evidence-based solutions.

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 are designed to anchor instruction and develop students' knowledge as outlined in the Texas Essential Knowledge and Skills (TEKS). Course-level content knowledge and skills are taught using scientific engineering practices (SEPs) and recurring themes so students can build and connect knowledge and apply it to new contexts. For example, the Unit 1 Overview in the Teacher Edition materials section scaffolds TEKS within the chapter outline. The chapters are designed to develop students' content knowledge and skills through "Unit Phenomena." The "Follow the Unit Phenomenon" table guides teachers through content development. For example, the "Chapter Review: Revisist Sea Pig Survival" guides teachers to have students "reflect on the role of sea pigs in cycling carbon and other matter" and how changes in stability would affect sea pigs and carrying capacity.

- Additionally, each Chapter Planner shows the systematic development of content knowledge and skills as the unit phenomena are continually referenced to develop and build student skills and content knowledge. For example, the Chapter 6 Planner references a revisit of the unit phenomenon in sections 6.1 and 6.3. This revisit of the phenomenon strategically and systematically develops students' content knowledge and skills as students acquire new knowledge and skills.
- Furthermore, the Chapter 6 Opener shows the strategic development of content knowledge and skills as chapter activities are taught using the recurring theme "stability and change," which allows students to build knowledge and apply it to new concepts. For example, in the Chapter 6, Opener, "students explore the concept of stability and change as they learn how cellular membranes use feedback mechanisms to manage a cell's interactions with its environment."
- Every lesson in the materials includes specific scientific and engineering practices connected to specific concepts appropriate for the grade level to deepen students' understanding of course content. The progression of the skills moves from practicing to developing toward mastery. Each chapter planner provides TEKS identifiers for material with connections for content. Progression of the complexity of investigations and questioning increases through the year. For example, in the *Custom eBook HS Biology, Teachers Edition TX,* Chapter 14 "Contents" identifies TEKS to facilitate through the lab. The difficulty of questions and evidence progresses compared to the Chapter 6 investigation.
- Materials support teachers in developing student content concepts and skills by providing objectives for chapter sections by giving them resources and cues at varying points in lessons and units throughout the grade level. For example, the *Custom eBook HS Biology, Teachers Edition TX* lists the objectives for "the study of life." In addition, misconceptions concerning the pace of evolution inform teachers of possible student issues and list the objectives for "using biology to develop solutions."
- In addition, each chapter planner strategically and systematically develops students' content knowledge. The sections are clearly outlined by topic with "Instructional Support for all Learners" to guide student development and SEPs. For example, The Planner includes "Investigations," "Performance Tasks," "Address Misconceptions," "English Language Learners," and "Vocabulary Strategy" to systematically develop students' content knowledge and skills.

Materials include sufficient opportunities, as outlined in the TEKS, for students to ask questions, plan and conduct classroom, laboratory, and field investigations, and engage in problem-solving to develop an understanding of science concepts.

- The materials include sufficient opportunities for students to ask questions. Each chapter guides students to "Ask Questions" on the margins of the text. For Example, in the *Custom eBook: HS Biology, Student Edition TX,* the text asks students to "Generate questions about the trophic level a brown bear occupies as its diet changes throughout the year."
- The materials include sufficient opportunities for students to plan and conduct investigations. For example, "Investigation B: A Medicine Distribution Solution," located in the Student Materials – Unit 1 Inquiry Hub section, asks students to "define the problem" and "design and evaluate a solution." In addition, "Tying It All Together" activities found throughout the *Custom eBook HS Biology, Teacher's Edition TX* showcase opportunities for students to ask questions and

plan and conduct investigations. For example, in "Chapter 13: Genetic Technologies," students develop a genetic engineering solution to conserve a hypothetical wild animal population.

- The materials include MiniLabs, which include sufficient opportunities for students to engage in problem-solving and develop an understanding of science concepts. For example, the Chapter 5 MiniLab, "Polar versus Nonpolar Molecules" provides guiding questions, procedures, and analysis questions for students to conduct investigations.
- In addition, materials include Case Studies that include sufficient opportunities for students to ask questions to engage in problem-solving to develop an understanding of science concepts. For example, the Chapter 7 Case Study, "Immortal Cells: The Study of Henrietta Lacks" requires students to read about HeLa cells and generate questions about "why controlled cell division is important for the growth and maintenance of organisms."
- Materials include opportunities for students to make cross-disciplinary connections and develop conceptual understandings. For Example, "Looking at the Data - Biomagnification of Mercury" in the *Custom eBook: HS Biology, Student Edition TX* has students Represent the Data, Analyze Data, Identify Patterns, Formulate "a claim," Apply, and Design. For the Apply section, students are asked to compare their data with the "Food and Drug Administrations recommendations."
- In addition, the "Tying It All Together" activities found throughout each chapter include opportunities for students to make cross-disciplinary connections and develop conceptual understandings. For example, in the Tying It All Together activity, "Solving the Mystery of Sloth Evolution," the *Custom eBook: HS Biology, Student Edition TX*, has students extend their knowledge as they research the field of paleo proteomics and apply it.

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

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

Evidence includes but is not limited to:

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

- Materials embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through authentic application and performance of scientific and engineering practices (SEPs). For example, the Unit 1 Overview within "Unit 1 Relationships" begins with the section "Unit Phenomenon." This section outlines the phenomena used throughout the chapter to "connect concepts back to the unit's Driving Question, supporting students in gathering evidence and asking their research questions so they are equipped to complete the Unit Activity." The Unit 2 Opener also contains the unit phenomenon "What do Bacteria do in Your Gut?" In this phenomenon, students read a passage about bacterial cells that will be referenced throughout the unit to "analyze models to understand the structures and functions of cells and how cells grow."
- Furthermore, each unit phenomenon contains "Gather Evidence" to support students in constructing, building, and developing knowledge through authentic application and performance of SEPs. For example, Chapter 5.3 contains a Gather Evidence text box that relates

the lesson text about carbohydrates to the unit phenomenon by asking students to consider, "Why might the relationship between bacteria and humans be described as symbiotic?"

- Once the problem question has been posed for each unit topic, students spend several class periods conducting investigations, collecting and analyzing data, referring back to previous lessons, and writing a summary stating the claim or answer to the question. For example, the *Custom eBook HS Biology, Teachers Edition TX,* poses the Unit 5 Phenomena driving question, *"*How did hummingbirds become adapted to their environment?" On page 432B, the "Follow the Unit Phenomenon" table has students gather evidence through Case Studies, MiniLabs, Looking at the Data, Tying it All Together, and various investigations throughout Chapters 14, 15, and 16, followed by a "Claim, Evidence, Reasoning" unit activity.
- The materials include phenomena and/or problems that connect to real-world scenarios at the unit levels. For example, students will answer the question "How do sea pigs survive in the deep ocean?" in the "Claim, Evidence, Reasoning" section located in the Unit 1 Overview.

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

- The materials leverage students' prior knowledge and experiences related to phenomena. For example, the Chapter 3 Opener located in Chapter 3, "Biodiversity and Ecosystem Stability" describes, "Students will likely bring prior knowledge of ecological relationships" and "Chapter 3 begins with a review of these relationships before exploring what biodiversity is…"
- In addition, materials include Case Studies to intentionally leverage students' prior knowledge and experiences related to phenomena and engineering problems. For example, Chapter 6, "Case Study Artificial Cell Technology" leverages students' prior knowledge of cell structure and function to analyze how "structures work together in cell systems."
- Furthermore, materials contain Chapter Reviews, which revisit the unit phenomenon to intentionally leverage students' prior knowledge and experiences related to phenomena and engineering problems. For example, the Chapter 6 Review intentionally leverages students' prior knowledge of cell structure, function, and energy transformations to address the problem of how antibiotics may lead to "an increase in pathogenic bacteria populations in their gut and develop gastrointestinal illness."

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

- The materials include "Unit Overviews" that clearly outline the scientific concepts and goals behind each phenomenon and engineering problem for the teacher. For example, the Unit 1 Overview in Unit 1 Relationships outlines the concepts and goals within Unit Phenomenon, TEKS Science Concepts Progression, Claim Evidence Reasoning, Following the Unit Phenomenon, and Planning Your Investigations. The Overview also contains learning goals: "Students analyze data and conduct research to develop a model of their chosen wetland ecosystem." The "Follow the Unit Phenomenon" table details the driving questions, data and Tying It All Together.
- Materials include "Tying it all Together" sections that clearly outline the scientific concepts and goals behind each phenomenon and engineering problem for the teacher. For example, the Chapter 7 Tying it all Together activity, "Immortal Cells: The Story of Henrietta Lacks," describes the Science Background that students need to know for the activity. Additionally, this activity

contains a section called “Case Study Connections” that ties the goals for this activity back to the previous Chapter 7 Case Study.

- The Unit 1 Opener in Unit 1 Relationships clearly outlines student learning goals in each chapter along with the Driving Questions. For example, in Chapter 2, “Students learn about the movement of energy and matter…” The materials also guide the teacher in “Introducing the Unit Phenomenon” and how to use the Driving Question to start the unit. The teacher will “have students make a list... to answer the Driving Question” and will need to focus on the energy source.

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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. 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 contain unit overviews that address the skills taught within each unit for each course and how they build a foundation for future science learning goals. The materials cite how the concepts connect to and extend the learning from previous grade levels. For example, the Unit 2 overview, located in the teacher's edition, shows vertical alignment to Texas Essential Knowledge and Skills (TEKS) learned in grades 6–8 in a section titled TEKS Science Concepts Progression. The Unit 2 overview contains a table titled Follow the Unit Phenomenon that details the intentional design of the materials for students to build and connect their knowledge and skills through case studies and MiniLabs within each chapter of Unit 2 to the unit phenomenon "What do bacteria do in your gut?" For instance, the Chapter 6 case study has the guiding question, "How do structures work together in cell systems?" The Chapter 7 case study has the guiding question, "How do cells divide and grow?" These guiding questions show that students will build their knowledge of cell structures and function and connect it back to the phenomena of "Bacteria That Live in the Human Gut."
- The chapter overviews cite the materials students learned in prior grade levels and how they apply to future learning. For example, the Chapter 4 overview states, "In middle school, students studied living and nonliving factors." This chapter expands on that prior knowledge by exploring

different methods." The overview also provides the Recurring Themes—Scale, Proportion, and Quantity section, which connects these concepts introduced in previous grade levels to support conceptual understanding and builds the content in Unit 2 "by helping students understand how chemical reactions in the cell are generally sampled . . . ."

- Materials show how lessons build and connect across the unit. For example, the Unit 5 overview, located in materials of the teacher's edition, references Grade 8 TEK 12, "the student learns about stability and changes in populations and ecosystems." Unit 4 covers how gene expression and variation explain change over time within a population. Unit 5, Chapter 14 begins by connecting genetic variation with evolution and the scales at which evolution occurs and then presents evidence for evolution. Students explore how fossils form and how to interpret fossils and associated geological evidence. Students also explore other evidence for evolution from genetics, molecular biology, embryology, and anatomy. In addition, materials progressively increase in complexity of student learning within the chapter and build to the next more complex chapter within the unit. For example, students learn about the evidence of evolution in Chapter 14, how the environment may trigger change in Chapter 15, and how humans may cause changes in the environment that may drive evolutionary change in organisms within it.
- Materials include unit summaries designed for students to build and connect their knowledge within a unit. For example, the Unit 2 summary outlines four topics from each chapter within a unit. The Unit 2 summary shows that students can build and connect their knowledge of molecules in living systems from Chapter 5 to their knowledge of cell structure and function in Chapter 6. Students use their knowledge of the four biomolecules learned in Chapter 5 to build and connect to the knowledge of cell structures, like the phospholipid bilayer, in Chapter 6. The topics in Chapters 5 and 6 help students build and connect knowledge and skills to the Chapter 7 topic, cell growth.
- The materials progressively increase in complexity within and across units in the content area. For example, the Chapter 4 planner, located in the materials of the teacher's edition, presents content in a way that increases in complexity. Students begin the unit measuring populations and build to "Modeling Population Growth" and "Factors that Limit Population Growth." The Tying It All Together section dovetails student learning over the unit, where students will research the "effects of urbanization on a native species and argue for actions to help conserve that population."

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

- Materials contain chapter planners that intentionally sequence and scaffold learning in a way that allows for increasingly deeper conceptual understanding. For example, within each chapter section of the Chapter 3 planner, located in the materials of the teacher's Edition, the progression moves from concrete to abstract. Students progress from Section 3.1, Ecological Relationships, to Section 3.2, Biodiversity, to Section 3.3, Ecosystem Stability and Change, where they recognize disturbances and relate the effects of natural disturbance on ecosystems. In Sections 3.1 and 3.2, students focus on distinguishing habitat and niche, classifying roles, distinguishing species, and identifying criteria. The materials support student learning by first introducing them to concrete materials such as organisms and their roles and biodiversity. Students then move on to a more abstract concept of ecosystem stability and ask students to apply organism roles to environmental disturbances.

- In addition, chapter planners contain an Explore/Explain table that shows how materials are intentionally sequenced to allow for an increasingly deeper conceptual understanding. For example, in the Chapter 5 planner, the Explore/Explain table titled Chapter 5.1 Elements and Compounds serves as a foundation for the progression of students learning toward Section 5.4, Chemical Reactions. Throughout the Explore/Explain table, scaffolds like differentiated instruction, vocabulary support, and visual support are presented to intentionally scaffold learning in a way that allows for increasingly deeper conceptual understanding.
- Materials include Differentiated Instruction sections that explicitly outline how materials are intentionally sequenced to scaffold learning in a way that allows for increasingly deeper conceptual understanding. For example, Section 5.3, Carbon Based Molecules, contains two Differentiated Instruction sections. The first differentiated instruction section in Section 5.3 outlines how the foundational knowledge of nucleic acids, learned in this section of Chapter 5, will be used in Chapter 11 to provide "more detail about how DNA functions to code for genetic sequences within organisms.
- Materials provide students with images representing the concept's model and checkpoints for understanding along the way. For example, Chapter 3, located in the student ebook, provides students with a map and pictures to compare changes over time. These visuals allow students to progress from concrete to representational understanding. Students continue to Habitat and Niche and symbiotic relationships in the section. The section ends with Restoring a Critically Endangered Frog Population, which encourages students to consider the question "Why was habitat restoration an important part of the El Rincon stream frog's species recovery plan?". In addition, in Unit 15, students can use the interactive versions of Figures 15-12, 15-13, and 15-14 to manipulate the graphs to see how distributions change over time. Students participate in a tracking evolution activity making calculations for the genotypic frequencies for coat color in different generations of deer mice. Students conclude the evolution of coat color in the population based on their calculations and make inferences about the causes of change in coat color.
- The materials contain case studies that sequence instruction to activate or build prior knowledge before explicit teaching occurs, allowing for increasingly deeper conceptual understanding. For example, the case study Where There's Smoke There's Fire, located in Chapter 3, provides activation of prior knowledge to assess student knowledge. The materials guide teachers to ask students to "identify different habitats" and "guide the discussion" of how disruptions can impact an ecosystem. As students progress through the chapter, the materials guide to "Revisit the Case Study" and provide embedded support.
- Students respond to questions that activate their background knowledge, and the materials direct the teacher to pose meaningful questions. For example, Section 15.1 asks students, "How could a flightless bird species have similar features to species living on the other side of impassable mountain ranges or across vast expanses of open ocean (Figure 15-3)?" Materials prompt the teacher to lead a class discussion covering the environmental similarities of where these flightless birds have been found.

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

- The materials clearly and accurately present course-specific core concepts and science and engineering practices (SEPs) through a phenomena-based curriculum approach and 5E lesson cycle formats. For example, the front pages, located in the student edition overview state the

driving questions to "help frame the phenomenon as something students can investigate throughout the unit." This overview also provides a chapter opener and case study that work together to introduce a phenomenon and related Driving Questions. The materials guide students to revisit these themes at the end of the chapter in the Tying It All Together activity and include callouts to connect concepts back to the case study." The materials guide content presentation through the SEPs through the phenomena-based delivery. For example, the student materials for the Unit 1 opener introduce students to the phenomena of sea pigs and guide students. stating "In this unit, you will explore systems and interactions." Students navigate through Earth's systems, the biosphere, matter, and energy concisely with real-world examples, models, and diagrams. Materials present lab investigations that allow students to explore the biomass pyramid models and organize and calculate data. Materials accurately connect all of these pieces by relating to trophic levels and the roles of organisms.

- Each "Chapter Planner" organizes all content into the Engage, Explore, Explain, Elaborate, Evaluate (5E) instructional model for sequencing science instruction, allowing for a clear and accurate presentation of core concepts and science and engineering practices. For example, the Chapter 2 planner, located in Unit 1, breaks lessons down into the 5E lesson frame. For Engage, students participate in the case study Something Fishy in the Forest. Explore and Explain list student goals for each chapter section, including Ecological Systems and Modeling the Transfer of Energy and Matter. For Elaborate, the materials provide the Tying It All Together activity and two performance tasks for evaluation.
- Another example is located in Chapter 16 planner. Students participate in the case study Tracking Tuskless Elephants and answer the question "Why do new species emerge while other species disappear?". While modeling speciation in chapter investigation, students explore and attempt to explain the process. Investigation B provides an opportunity to explore "How can wildlife crossings or corridors help a species access all parts of its habitat?". Students will investigate problems of mountain lion habitat fragmentation and create a model of wildlife crossing for mountain lions. The Tying It All Together activity allows students to elaborate and answer the higher level questions. For example, "Under what conditions could the presence of the gene for tusklessness in an elephant population lead to speciation?". Chapter 16 also provides assessments and performance tasks for evaluation.
- Materials contain Scientific and Engineering Practice sections embedded within each chapter, which help to clearly and accurately present course-specific concepts and science and engineering practices. For example, Section 6.1, Cell Structures, contains a Scientific and Engineering Practices section with students using a model to identify and explain cell structures, like the nucleus. This emphasis on the scientific and engineering practice of models highlights the course-specific core concepts of the chapter (i.e., the nucleus) and helps to clearly and accurately present content.
- In addition, The materials include conceptual learning strategies, concrete mathematical applications, and student-driven hands-on practice. For example, Section 2.3 and the Chapter 2 assessment, located in the *Custom eBook: HS Biology, Student Edition TX*, study the flow of energy and matter distribution. Students use mathematics to calculate energy transfers, use different models, answer reflective questions, create energy pyramids, and participate in a MiniLab. The MiniLab asks students to model biomass distribution and calculate how much biomass transfers. This activity connects the concepts students learned in the unit section.
- Materials include Looking at the Data activities that clearly and accurately present course-specific concepts and science and engineering practices. For example, the Chapter 7 Looking at the Data activity, Identifying Gene Mutations in Cancer Cells, allows students to practice the

Science and Engineering Practice (SEP) of "analyzing and interpreting data" while also strengthening content knowledge of cell growth.

- The materials present course-level core concepts and science and engineering practices (SEPs) in a scientifically accurate way. Materials present investigations that allow students to explore course-level concepts and SEPs and accurately connect all of these pieces of information. For example, in the ancillary components, located in Chapter 15, Biology Lab Manual, materials provide four different types of investigative labs: Investigations A and B, a MiniLab, and a virtual lab.

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

- The materials include specific learning targets for each course. The materials provide unit objectives for each chapter and student learning objectives for each lesson which define the boundaries of the course's main concepts. For example, under Section 4.1, Measuring Populations, located in the Chapter 4 planner, students will "identify methods used by scientists to measure populations" and "describe how mathematical representations can be used to estimate populations without having to count each organism." Additionally, under Section 16.2, Extinction, located in the Chapter 16 planner, the objectives are to (a) identify the different kinds of extinction that lead to the elimination of species, (b) evaluate the protections provided to endangered and threatened species, and (c) differentiate the causes of species decline.
- The materials include chapter openers, which outline students' prior knowledge and the learning targets for the upcoming unit. For example, the Chapter 4 opener provides mastery requirements in the Chapter 4 overview. For example, "In middle school, students are likely to have studied living and nonliving factors" and "Students will learn more about how scientists measure populations . . . ."
- In addition, the chapter openers demonstrate how mastery requirements of the materials are within the boundaries of the course's main concepts. For example, the Chapter 5 opener located in the Chapter 5 overview provides the chapter learning objective "Students will be reminded about the parts of atoms and learn how bonds between atoms form. They will explore how properties of water support life and how organic molecules function in organisms, and they will see how chemical reactions in biological systems allow for, and support, life." This chapter's learning objective defines the boundaries of content knowledge and skills that students must master.
- Furthermore, materials include chapter subsections that demonstrate how mastery requirements of the materials are within the boundaries of the course's main concepts. For example, Section 7.2, Mitosis, provides two course-specific learning objectives within the boundaries of the course's main concepts. The Chapter 7.2 learning objective, "describe chromosomes and the structure of DNA," directly contributes to the student's mastery of TEKS 7A.

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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 Texas Essential Knowledge and Skills (TEKS).	M
3	Materials explain the intent and purpose of the instructional design of the program.	M

Meets| Score 6/6

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

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

Evidence includes but is not limited to:

Materials support teachers in understanding the vertical alignment of course-appropriate prior knowledge and skills guiding the development of course-level content and scientific and engineering practices.

- The materials support teachers in understanding the vertical alignment of course-appropriate prior knowledge and skills guiding the development of course-level content and scientific and engineering practices. The materials include unit overviews that support teachers in understanding how new learning connects to previous and future learning across the course. For example, the Chapter 5 overview, located in the Chapter 5 opener of the teacher materials, outlines how vertical alignment from middle school provides course-appropriate prior knowledge and skills to the development of new course-level content by saying "In middle school, students will have been introduced to molecules in organisms and learned about the role of photosynthesis and how elements are cycled as matter in the environment." This chapter expands on that prior knowledge by exploring the molecules of living systems and their interactions.
- In addition, unit overviews support standards-based instructional planning with theTEKS Science Concepts progression from middle school to high school. For example, the Unit 5 overview lists

the TEKS covered in logical and progressional order in grades 6–8, leading to Unit 5, Evolution and Changing Environments TEKS.

- The materials contain detailed instructions to guide teachers in implementing experiments that correspond with the concepts and skills to be mastered and promote conceptual learning and the development of SEPs. Within the Chapter 2 planner, located in Unit 1, students learn about ecological systems, energy transfer, and the cycling of matter. Chapter 2 Investigation B, Exploring Brine Shrimp Survival, contains detailed instructions to guide teachers in implementing scientific and engineering practices. For example, the materials describe what students will accomplish (e.g., advance preparation, possible materials, prelaboratory assignment, facilitating the investigation, sample information, rubric). In addition, materials provide clear vertical alignment for these activities. For example, in the Chapter 3 overview, located in Unit 1, the materials describe students' prior knowledge of concepts learned in middle school, and Chapter 2 begins with a review of these relationships.
- The materials include Science Background sections that explain how content and concepts increase in depth and complexity across lessons and units within the grade level. Chapter 5.3, Carbon-Based Molecules, contains a Science Background section about lipids. This section provides suggestions to the teacher about facilitating a discussion about the structure and function of lipids. The materials support teachers in understanding the vertical alignment of these discussions. For example, the Unit 2 overview provides Grade 8 TEKS 6.B (i.e., use the periodic table to identify the atoms and the number of each kind within a chemical formula), which builds to the TEKS 5.A (i.e., relate the functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids, to the structure and function of a cell). Students learn that atoms make up molecules in grade 8 and continue that learning in grade 9 biology, learning how different molecules relate to the structure and function of a cell. This section outlines how this knowledge will allow for increasingly deeper conceptual understanding by saying, “This section introduces the concept of phospholipids and how they behave in water.” Section 6.2 discusses these interactions more deeply and explains how their structures allow for the fluid movement of phospholipid molecules in the fluid mosaic model.

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 common course-level misconceptions, support for the teacher's subject knowledge, and recognition of barriers. For example, in the Chapter 4 planner, embedded support for Section 4.2, Modeling Population Growth Patterns, includes support for teachers in the Use Mathematics, Connect to Mathematics, In Your Community, Scientific and Engineering Practices, Patterns, Misconceptions, and Science Background. Misconceptions for the unit include the objective “students interpret a constant rate *r* as adding *r* new organisms in each generation . . . .” The material provides an explanation and concepts to emphasize. Each section provides background information, common course-level misconceptions, and support for teachers to develop their understanding. In the Science Background section, the materials support teachers with a description of R and K selected species with examples of different species.
- In addition, materials include the Address Misconceptions section within the chapters, which supports the recognition of barriers. For example, Section 6.1, Cell Structures, has an Address

Misconceptions section that differentiates the size of prokaryotic and eukaryotic cells. In this section, teachers are guided to ask students to find the average diameter of a eukaryotic cell and a prokaryotic cell and to use the information to develop a to-scale model for the size of the two cell types.

- Furthermore, materials include English Language Learners (ELL) supporting materials. For example, Section 7.3, Cell Differentiation, contains an ELL section with explanations and examples of discussion activities that can be used at each level of language acquisition. In addition, materials provide teachers with a Differentiated Instruction | Leveled Support section found throughout the units in the teacher's edition. For example, in the Unit 14 Lines of Evidence lesson, materials assist teachers by providing directions for struggling students: “To help students understand the concept of evolution, connect it to an everyday life experience.” Even in students' lifetimes, they have likely seen things change over time. For example, most students are aware of changes in cell phones. Have students work in pairs and choose an item in which they can trace back changes through the years. If need be, they can research the changes in phone features. Have students create either a print or digital timeline. Tell them to explain if the changes were to the whole phone or just parts of the phone.
- Materials include a pretest for each unit to assess student knowledge to support the teacher's recognition of barriers to student conceptual development. For example, the Chapter 14 Pretest section found in Unit 5, Chapter 14, of the teacher's edition, directs teachers to use questions 6 and 7 to identify gaps in background knowledge or misconceptions.

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

- Materials provide a framework that explains the intent and purpose of the program's instructional design. For example, the teacher's edition overview located in the front pages of the teacher materials provides a breakdown of each of the tools in the materials and the intent behind each tool. This includes the unit overview Planning Your Investigation, Assessment Planning; the chapter planner and opener; the Address Misconceptions Differentiated Instruction sections; and more. The unit overview explanation supports standards-based instructional planning with the TEKS Science Concepts progression from middle school to high school.
- Materials explain why materials are designed the way they are. In addition, materials detail the heavy emphasis on students constructing explanations rather than teachers giving explanations and giving the why behind this design. For example, materials provide a narrative from Dr. Catherine Quinlan that explains why National Geographic uses student-centered learning and how different opportunities benefit students by preparing the next generation to become scientifically literate citizens.

Cengage Learning National Geographic Biology, Texas Edition

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 consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. Throughout the chapter sections, the reading material asks students to predict and explain to support the sensemaking of the reading materials. For example, student materials in Chapter 2.1, Ecological Systems, present a scientific scenario of an ecological system and ask students to think critically by considering the relationship between the organisms in a tide pool with the cycle of the tides and how increasing sea levels affect these organisms. Student materials include the unit phenomena in Section 2.2, where students are guided to gather evidence about the ecological role of sea pigs.
- The materials consistently provide learning activities that support students' meaningful sensemaking through Looking at Data exercises. Materials include Looking at the Data activities

that consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. For example, the Chapter 5 Looking at the Data activity titled Digestive Enzymes and pH, requires students to analyze data graphs to determine the ideal function of enzymes, like lactase, and their role in catalyzing reactions. This activity falls immediately after the Section 5.4 Chemical Reactions lesson. It helps students' meaningful sensemaking of this topic by providing opportunities for students to read and interpret data, write explanations regarding the data, and think and act as scientists who study chemical reactions.

- In addition, materials include Tying It All Together activities that consistently support students' meaningful sensemaking through reading, writing, and thinking. For example, the Chapter 5 Tying It All Together activity titled Turning Molecules into Medicine allows students to make sense of all Chapter 5 knowledge and skills during an investigation on the medicinal uses of alkaloids. Students read a passage about the medicinal uses of alkaloids to write explanations to questions. Additionally, students think and act as scientists by using evidence from your research to support or refute the following claim: Plant alkaloid research is an effective way to find new medical treatments.
- Furthermore, materials include Visual Support activities that support students' meaningful sensemaking. For example, in the Visual Support activity in Chapter 9.1, students choose one of the examples of stem and root variations and then construct a written explanation of how their selected plant's adaptation helps it survive in its environment. Teachers remind students that they must include evidence to support their claims.
- Materials support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers by providing multiple investigations for each chapter. For example, Chapter 15, Investigation B, states, Students will investigate three days to observe bacterial growth in the presence and absence of ampicillin to claim why a single antibiotic is ineffective against all bacteria. During the investigation, students will read pre-lab material online, write out answers to questions asked, analyze data, and evaluate antibiotic resistance in bacteria. Students will continue by claiming the question they investigated and using logical reasoning to connect the evidence to their claim to support it.

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

- The materials provide opportunities for students to engage in purposeful and targeted activities with appropriate scientific texts for the course. In the Student Materials, each section in each chapter includes reflective questions after engaging in a scientific text for students to interact with the text to gather evidence and develop an understanding. For example, in the Biotic Potential and Exponential Growth section in Section 4.2, Modeling Population Growth Patterns, students are asked to describe the difference between the biotic potential and the population's growth rate. In addition, the text includes graphs, pictures, tables, and math calculations.
- Each chapter section includes activities, such as pre-reading and vocabulary, to provide multiple opportunities for students to engage with the scientific text and develop an understanding of science concepts. For example, in Section 1.1, The Study of Life, the materials suggest a Vocabulary Strategy word wall for students to use throughout their study of biology. For English Language Learners, the materials provide Spelling and Memorizing Vocabulary to assist students in developing an understanding of concepts. Within the text of Section 1.1, Study of Life, the key terms are located at the top and include opportunities to interact with the text through

questions. In addition, each chapter includes Case Study sections that provide multiple opportunities for students to engage with the course-level appropriate scientific text to gather evidence and develop an understanding of concepts. For example, Chapter 6, Artificial Cell Technology Case Study, provides students the opportunity to reengage with the unit phenomenon. Additionally, this case study serves as a pre-reading for Chapter 6 and introduces vocabulary terms, such as cell membrane, to help develop an understanding of upcoming chapter concepts.

- Materials provide opportunities for students to engage with the grade-level appropriate scientific text to gather evidence. Each chapter includes a Meet the Explorer section that provides an article describing the research of scientists around the world, which connects to unit studies. For example, in the Meet the Explorer section in Unit 5 titled The Hummingbird's Secret to Survival-Examining Extreme Energy Conservation, students are asked, “What is the evolutionary benefit of an energy-conserving mechanism such as torpor?”, which is listed under the Thinking Critically section. Students answer this question after reading the article and gathering evidence from the text.

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

- The materials provide multiple opportunities for students to communicate thinking on scientific concepts in written and graphic modes by conducting investigations where evidence is documented in written and graphic modes. For example, Chapter 16, Investigation A, provides opportunities for students to explain lab results by explaining what happens to the various populations during the experiment. Students are told to draw a cladogram showing your species. Mark extinct species on the cladogram. Students are also asked to complete four different data tables during their investigation. Materials allow students to claim the question they investigated and provide evidence from their investigation to support their claim.
- In addition, materials include MiniLab activities 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. For example, the Chapter 2 Minilab, Model a Biomass Pyramid, asks students to organize data by drawing a bar graph that shows the biomass at each level, calculating the biomass, and writing. Students write two responses on interpreting the data and predicting what happens if the biomass does not transfer.
- The materials provide multiple opportunities for students to record their ideas, questions, drawings, charts, and graphs to discuss and revise their understandings at various lesson stages. For example, in The Carbon Cycle button located in Section 2.4, Cycling of Matter, students are asked to draw a model that shows the role of photosynthesis and cellular respiration. Throughout the sections in Section 2.4, the materials ask students for written responses as reflective questions by predicting or explaining. The materials provide an Idea Diagram for students to fill out for the Cycling Through the Spheres activity. In addition, materials include Looking at the Data activities that allow students to engage in written and graphic modes of communication. For example, the Chapter 5 Looking at the Data activity titled Digestive Enzymes and pH allows students to engage with written text to understand lactase's role in lactose intolerant people. This activity provides a table detailing digestive enzymes' roles, and a graph, showing the relative function of digestive enzymes at various pH levels. Students use this

graphic communication to display an understanding that enzymes function under ideal conditions and develop an understanding of how enzymes work in the body.

- Furthermore, materials include interactive figures throughout the text that support students in developing and displaying an understanding of scientific concepts. For example, the Interactive Figure Selection Patterns sidebar located in Section 15.2, Evolution of Populations, in the teacher materials instructs teachers that students can use the interactive versions of Figures 15-12, 15-13, and 15-14 to manipulate the graphs to see how distributions change over time.

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

- Materials support students to act as scientists and engineers by engaging in phenomena and engineering design processes and making sense of concepts. For example, in Chapter 3, students learn about relationships, biodiversity, and ecosystem stability. They transfer their learning in the MiniLab Observing Biodiversity. Students observe organisms and record observations. They compare their findings with the class and conclude why they are different. Students explain What biotic and abiotic factors might influence the diversity and then plan their investigation.
- Materials include Unit openers that serve as unit phenomena and support students as practitioners while they are figuring out (sensemaking) and productively struggling. For example, the Unit 2 opener allows students to act as scientists as they begin to tackle the question “What Do Bacteria Do in Your Intestines?” Throughout Unit 2, students will reengage in this phenomenon by writing explanations, applying new content knowledge, and productively struggling toward an answer to this question.
- Materials include Investigations that engage students to make sense of concepts through productive struggle as they design an experiment based upon specified criteria and outcomes. For example, Chapter 6, Investigation B, Designing a Photobioreactor, allows students to engage in the phenomenon of photobioreactors and create a design for a photobioreactor for the International Space Station (ISS). Students apply recently-learned unit knowledge of photosynthesis and cellular respiration to research, design, and build a prototype of a photobioreactor for the ISS. Students engage in productive struggle through testing and redesigning their prototypes.
- Materials create transfer opportunities for students to take what they have learned and use it flexibly in new situations and prioritize students making evidence-based claims to construct explanations. For example, the Tying It All Together activity in Chapter 16 requires students to use evidence from each section and outside resources to apply the scientific ideas and evidence introduced through the lesson to develop an explanation of how the tusklessness trait will change the population. They should link evidence from the graph to the reasoning provided throughout the lesson to make an evidence-based explanation about the effects of poaching and human impacts on forest and savanna elephant populations.

Cengage Learning National Geographic
Biology, Texas Edition

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, Investigation B, Open Inquiry Comparing Genetic Information Among Organisms, located in Chapter 14, includes a Claim, Evidence, Reasoning section that states, "make a claim about the question you investigated. Provide evidence from the lab that supports your claim. Then use reasoning to logically connect the evidence to your claim and show how it supports it." Students are challenged in the investigation to Identify differences between amino acid sequences among known and unknown organisms and summarize your findings, analyze skulls, fossil records, and radiometric data to compare known and unknown organisms and summarize your findings, and use this data to determine the most likely identity of the unknown organism.
- The materials specifically prompt students to use evidence when supporting their hypotheses and claims. For example, the MiniLab Polar vs. Nonpolar Molecules in Chapter 5 requires

students to first determine how you will be able to tell whether each substance is polar or nonpolar, and then predict whether each substance is polar or nonpolar, before they participate in a laboratory experiment. Throughout the experiment, students collect data on the polarity of substances. After the experiment, students use their data to interpret the results of their tests to indicate whether a substance is polar or nonpolar and justify how the results match their predictions. In this way, students use their evidence from the experiment to support their original hypothesis for each substance. In addition, the Follow the Unit Phenomenon unit activity in the Unit 3 overview prompts students to use the evidence they gathered throughout the unit to support their claim with reasoning. In this unit, the students revisit the unit phenomenon of the systems in a rainforest that allows organisms to survive, grow, reproduce, and respond to the environment. For the Claim, Evidence, Reasoning activity, students use the evidence they gathered throughout the unit to support their claim with reasoning.

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

- The materials include embedded opportunities to develop and utilize scientific vocabulary in context within each chapter subsection. For example, the Word Families sidebar in Section 2.1 in the teacher's edition introduces Greek root words and provides additional materials for English Language Learners (ELLs). The materials include context application with additional activities, including using embedded figures to write labels and discussing local ecosystems.
- The materials include embedded opportunities to present scientific vocabulary using multiple representations. For example, the Vocabulary Strategy section titled Prefixes/Suffixes/Root Relationships in Section 9.3 in the teacher's edition guides the teacher to review with students that the word alternation is the noun form of the verb alternate. Students then write their own definition of alternation of generations.
- In addition, the Vocabulary Strategy sections provide opportunities for students to apply scientific vocabulary within context. For example, the Vocabulary Strategy section titled Word Wall in Section 15.1 in the teacher's edition states, “Create a word wall with the new vocabulary terms students will need to know. Post terms as they are introduced in the section. Refer back to the word wall at the end of the section to encourage students to use the terms to summarize their learning.” Students can also make their personal word wall in their notebooks to use when studying.
- The materials provide experiences with new concepts and opportunities to use the vocabulary presented. For example, the Ask Questions section in Section 5.4 requires students to Generate a question about how equilibrium affects the process of making a naturally occurring compound in a laboratory. This short activity comes directly after the text that introduces the vocabulary term equilibrium and allows students to develop and utilize this scientific vocabulary through this embedded practice.

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. For example, Chapter 15 provides a Connect to Language Arts activity in which students use Table 15.1 to discuss and evaluate the conclusions in the text and use evidence in Figure 15-8 to corroborate or challenge the conclusions. Students should recognize that natural selection is not random, as

those with adaptive traits are more likely to reproduce, which results in more offspring with adaptive traits. Have students discuss the adaptive traits from Figure 15-8 and how each trait was better suited for the finch's environment and increased the survival of finches with that trait.

- The materials include Performance Tasks in each unit that provide opportunities for students to develop how to engage in argumentation and discourse, supporting student development of content knowledge and skills. For example, the Performance Task titled How Does Regenerative Medicine Reflect Nature in Unit 2 requires students to demonstrate mastery over Unit 2 topics through research, modeling, and presentation. In this performance task, students must engage in discourse to research their topic and then create a presentation for the rest of the class. The materials provide a rubric for integrating discourse by detailing that an excelling report must include the following components, information is communicated clearly and in a manner that is easy to follow. Information is accurate and supported with credible references. Information includes complete descriptions and comparisons of two models.
- The materials integrate argumentation and discourse within stages of the learning cycle, supporting student development of content knowledge and skills. For example, in the investigation Designing a Seed Trap in Chapter 4, teachers group and determine roles for students in designing seed traps. Students collaborate on the design, redesign, and reflect on their work: "Students should discuss the changes they made to their design . . . ." Additionally, the Scientific and Engineering Practices section in Section 5.1 has students engage in a discussion to debate why the electrons are illustrated as a cloud as opposed to each electron being in a fixed location. This integration of discussion and debate supports students as they learn the parts of an atom in Section 5.1. Furthermore, the Vocabulary Strategy section in Section 5.1 requires students to create word posters for a word wall. As students learn new vocabulary, they create posters and then engage in argumentation and discourse to vote on the posters that they think best embody the terms and hang these on the word wall. This vote through argumentation and discourse allows students to develop their content knowledge and skills as they learn new vocabulary.

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.

- The materials provide opportunities for students to construct and present developmentally appropriate written and/or verbal arguments that justify explanations of phenomena and solutions to problems using evidence acquired from learning experiences. For example, in the Mini-Lab instructions in Chapter 9, located in the student resources, students work with a model of DNA and related components and determine a way to demonstrate DNA replication, transcription, or translation using their model. Students identify their necessary components, describe the sequence of events, evaluate the strengths and limitations of their chosen process model, and then construct an explanation of how their model works with other processes to accomplish gene expression.
- The materials include performance tasks that provide instruction for constructing and presenting a verbal and written argument to problems using evidence acquired from learning experiences. For example, in the performance task titled Why Should We Preserve Wetland Ecosystems in Unit 1, students research and create a model over the cycling of matter for preserving wetland ecosystems. Students then communicate information and defend an

argument in a presentation over their chosen wetland. In addition, the performance task titled How Does Regenerative Medicine Reflect Nature in Unit 2 allows students to construct and present written and verbal arguments based on cell regeneration in various organisms. In this performance task, students are provided with instructions on conducting research, building their models, and eventually communicating their explanations of the phenomena of cell regeneration. Additionally, materials provide students with criteria for a successful oral presentation that include: descriptions of each model, a comparison of the two regenerative processes, and a summary of the roles that cell division and cellular differentiation each play in the two regeneration processes.

- The Tying it All Together sections provide opportunities for students to justify explanations of phenomena and solutions to problems using written and verbal arguments to problems using evidence acquired from learning experiences. For example, the Tying it All Together activity titled Turning Molecules into Medicine in Chapter 5 allows students to construct written arguments that justify their claims about phenomena. In this activity, students read a passage and complete a claim, evidence, and reasoning (CER) exercise. Students can work individually or with groups to construct written and verbal arguments to the claim that alkaloid plant research is an effective way to find new medical treatments based on the evidence that they find in their research.
- The materials provide criteria for developmentally appropriate arguments to explain a phenomenon or defend a solution to problems using evidence acquired from learning experiences. For example, Investigation B, Evolution of Antibiotic Resistance in Bacteria, located in Chapter 15, provides a Claim, Evidence, Reasoning section in which students will justify their explanations after they have modeled lab technicians assigned to test a sample from a sick patient to determine if the antibiotic can be recommended. The Claim, Evidence, Reasoning section states, Make a claim about the question you investigated. Provide evidence from the lab that supports your claim. Then use reasoning to logically connect the evidence to your claim and show how it supports it. A rubric provides criteria students need to include for scoring the category Constructing Explanations and Arguing From Evidence. The rubric states for an Excelling score, a student should include appropriate and sufficient evidence were used to construct an explanation for antibiotic resistance and reasoning that links to evidence to recommend antibiotic treatment for the patient.

Cengage Learning National Geographic Biology, Texas Edition

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

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

Evidence includes but is not limited to:

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

- The materials guide the teacher on anticipating student responses and using questioning to deepen student thinking in the section overviews embedded in the chapter planner. In the outlined subsections, the materials provide possible student and teacher responses and deepen student thinking through questioning. In Unit 1.1, The Study of Life, the materials provide the possible sample student response in the Describe section: "Students might say that they interact with both humans and a dog. . . ." The materials in Unit 1.1 also provide support for teachers with questions and teacher responses in the In Your Community sections. The materials guide teachers to ask students if they are familiar with labels that have GMO... and guide teachers, if students are unfamiliar, explain that selective breeding. . . ."
- In addition, materials include Review sections at the end of each chapter subsection that provides teacher guidance on anticipating student responses and using questioning to deepen student thinking. For example, the Review section in Chapter 6.2, Cell Membranes, in the teacher's edition provides teacher guidance for the use of questioning to deepen student thinking about chapter material by providing scripted questions, such as What is the difference between diffusion and osmosis? The Review sections in the teacher's edition materials also guide teachers on anticipating student responses by including sample student responses, such

as Diffusion is the spontaneous movement of atoms or molecules through a fluid or a gas. Materials diffuse from higher to lower concentrations and across membranes. Osmosis is a special case describing the movement of water molecules across a boundary such as a cell membrane.

- The materials include MiniLabs, which support teachers to deepen student thinking through questioning. For example, the MiniLab Selectively Permeable Membrane, located in Chapter 6, includes teacher guidance on deepening student thinking through questioning, such as “How do molecules move through the cell membrane?” Students experiment to answer this question and complete an analysis of their results. Further teacher guidance on anticipating student responses to the analysis questions is provided as sample correct answers, such as If the outside solution had a higher concentration of glucose, glucose would move from outside to inside the tubing, which are listed in the teacher's edition text. An additional example is in the Materials and Advance Preparation section of the MiniLab: Comparing Reaction Speed located in Chapter 10. The teacher starts the lab with a brief discussion about whether catching a dropped object is a reflex action. The teacher is prompted to ask whether it is possible to get better at catching a dropped object with practice. The teacher is provided with the following statement: “Generally, reflex responses cannot be trained to be faster, while non-reflex responses can, in anticipation of a possible student response.” The teacher's final question is, “Ask the students to think about which body systems would be involved in a reflex and a non-reflex response.”
- In addition, materials provide multiple instances of teacher guidance on anticipating students’ responses and use of questioning to deepen student thinking by providing red bolded Pattern, Infer, Ask Question, and Explain opportunities throughout each chapter. For example, after students have read four paragraphs introducing developmental evidence for evolution, Chapter 14 provides the Explain question “How do similar structures during development provide evidence of a common ancestor among all vertebrates?” The Explain sample answer provided by the text is, “Similarities among vertebrate embryos that develop into adults with very different body forms indicate they share a common ancestor.”

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

- The teacher materials in the chapter subsections include teacher guidance on scaffolding and supporting students’ development and use of scientific vocabulary in context. For example, the Vocabulary Strategy activity located in Section 3.1, Ecological Relationships. in the teacher's edition guides teachers to point out that the word competition is a noun and elicit responses for the word compete and continue the discussion with predator and symbiosis. Students later use their knowledge of symbiosis to identify relationships, watch a video, use examples in their community, and answer questions about symbiotic dynamics in ecosystems. Another example is found in the Vocabulary Strategy activity Prefixes/Suffixes/Root Relationships located in Section 10.2, Defining Animal Systems, in the teacher's edition; the teacher teaches roots and prefixes using the word inflammation, which comes from the Latin prefix in-, which students should be familiar with, and the root flammare, which means to flame. Teachers are prompted to suggest that students add key terms to a word tree or graphic organizer as they work through the chapter. The teacher can also encourage students to look up the etymology of key terms in the lesson as they fill in their graphic organizers.
- In addition, materials include Visual Support sections in chapter subsections that include teacher guidance on scaffolding and supporting students’ development and use of scientific vocabulary

in context. For example, the Visual Support section located in Section 5.3, Carbon-Based Molecules, provides teacher guidance on how to scaffold and support students' use of the scientific vocabulary words nucleotide and nucleic acid. In this activity, the teacher is directed to group students to build models of DNA, but they should use their language to identify which part of the structure is the monomer (i.e., nucleotide) and what makes up the entire nucleic acid, which in this case is a strand of DNA. In this activity, teachers are guided to help scaffold students' development of scientific vocabulary.

- Furthermore, materials guide teachers on scaffolding and supporting student development for key terms throughout each chapter. For example, the Address Misconceptions' section in Section 14.3, Developmental, Anatomical, and Genetic Evidence, in the teacher's edition assists teachers so that students understand the connections between divergence and convergence and how it relates to homologous and analogous structures: "vergence and Convergence: To help students understand how homologous and analogous structures are evidence of the processes of divergent evolution and convergent evolution, draw a model on the board. Begin by drawing two arrows at the same point and then diverge. Point out that to diverge means to move apart. Then, draw two arrows that begin at two different points and converge at one point. Point out that to converge means to come together. Ask students what each model represents and what types of structures are formed. (Divergence results in homologous structures; convergence results in analogous structures.)"

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

- The materials provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims. For example, in the Recurring Themes activity Unexpected Effects located in Section 10.4, Animal Behavior, in the teacher's edition, the teacher explains that understanding cause-and-effect relationships is essential to understanding how to interpret scientific observations. Most animal behaviors and traits can be linked to how they increase an animal's ability to survive and reproduce. However, as seen in Figure 10-14, occasionally, the behaviors do not work out for the animal as expected. The teacher has the students make a chart, and they list behaviors described in the text and then identify the cause-and-effect relationship each behavior has on the survival or reproductive success for the animal. The teacher is to make sure that students are making correct correlations between the causes and effects and that they are making specific claims in their charts that are supported by the text.
- The materials include unit activities that provide teacher questions and guidance for supporting student discourse and using evidence in constructing written and verbal claims using Claim, Evidence, and Reasoning (CER). For example, the Unit 1 activity located in the Unit 1 opener provides a CER template and guides the teacher that students should answer the question: How do sea pigs survive in the deep ocean? and review their answers from prior inquiries in the chapter, and students may use models for explanations. Additional guidance for English Language Learners (ELL) in the sidebar provides differentiated support for beginning, intermediate, and advanced/advanced high students to cite text evidence and create their own CER. The materials guide the teacher to allow them to discuss their ideas verbally before writing. Additionally, the Unit 2 activity located in the Unit 2 opener requires students to perform a

Claim, Evidence, Reasoning (CER) to answer the question posed at the beginning of the unit. The Unit 2 Activity provides step-by-step teacher guidance for each part of the CER, such as Students should write their answer to the question: What do bacteria do in your intestines? while also providing sample student answers, like Bacteria produce some vitamins needed by the body to help the teacher support students in using their evidence, gathered throughout the unit, to construct the written CER.

- The materials include Investigations, which provide teacher guidance for giving feedback on student discourse and using evidence to construct claims. For example, Investigation A: Converting Carbohydrates, located in Chapter 5, guides teachers to organize the class into groups of two to four students and that everyone in the group needs to have a role in the investigation. Throughout the investigation, students will work with their partners to discuss answers to scripted analysis questions, such as Based on your results, explain how amylase acts on simple sugar molecules and starch molecules. After this discourse, guidance is provided to support students in using their evidence from the investigation to complete a claim, evidence, and reasoning activity. A rubric for teachers to grade excelling investigation reports, and a sample student answer to the claim, evidence, and reasoning activity are provided to help teachers support students in using their investigation evidence to construct a written report.

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

- Materials provide On the Map activities that support and guide teachers in facilitating the sharing of students' thinking. For example, in Chapter 16, the text introduced the formation of the isthmus of Panama's formation three million years ago. The On the Map activity provides the teacher with the conversation starter The Panama Canal was completed in 1914. Materials guide teachers for this lesson: "Have students discuss how the canal's construction affected society in the United States and elsewhere. Then, have students identify possible ways the separation of land by the canal may have affected different species. Guide a discussion about the impacts of populations being separated by the canal and the new opportunity for species once separated to then come together via the canal."
- The materials include Investigations that provide teacher support for facilitating the sharing of students' finding solutions. For example, in Investigation A, Making Real-World Observations, located in Chapter 1, students summarize your organism's characteristics in a presentation format to share with the class and provide evidence based on the data you collected. The information in the documents for students supports teachers in sharing their thinking and findings. Other examples of shared thinking include Investigation B in Chapter 1, where students share your proposal with the class to get feedback.
- In addition, chapter subsections include Recurring Themes sections that support and guide teachers in facilitating the sharing of students' thinking and finding solutions. For example, in the Recurring Themes activity titled Cause and Effects- Benefits and Drawbacks located in Section 10.4, Animal Behavior, in the teacher's edition, the teacher's manual states, "To support their understanding, allow students to work through this section as a group. After completing the reading, have them consider the effect of animals living in groups for predators and prey. Let them discuss why the animals discussed in the lesson live in groups. Then, have them identify possible good and bad effects of living in a group and connect how effects at a small scale can lead to changes in the entire group. Students use evidence from the text and outside sources to support their arguments. Still, they should carefully assess whether or not the evidence supports

their claim. After the groups have completed making their claims, bring the class back together for a full discussion."

- The materials provide teacher support and guidance to engage students' thinking in various modes of communication throughout the course. For example, The Unit 2 Engage section in the unit phenomenon contains an Introduce the Unit Phenomenon subsection that guides teachers to start a class discussion about the role of bacteria in the body by prompting students to think of their own experiences with bacteria by mentioning a visit to a doctor to get a prescription for an antibiotic to kill harmful bacteria causing an illness. Then, materials guide teachers to elicit from students if they are aware of any ways bacteria are helpful to the human body to support students' thinking as they grapple with the Unit 2 phenomenon.
- In addition, the materials include case studies that engage student thinking and provide teacher support and guidance. For example, in the sidebar of the case study Sharing Our Cities in Chapter 4, the materials guide teachers to elicit discussion about how the range of coyotes has changed throughout the past 200 years and engage prior knowledge by asking them to describe the coyote's historical range. The materials further guide teachers in the English Language Learners (ELL) sidebar for students to work in pairs, summarize their paragraph using a graphic organizer, and provide sentence stems for student thinking. Afterward, students watch videos 4-1, and the class discusses how coyote populations may be affected by development and discusses the positive and negative impacts of human development.

Cengage Learning National Geographic Biology, Texas Edition

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.

- Materials include an assessment handbook in the teacher's edition that includes a range of diagnostic, formative, and summative assessments to assess student learning in various formats. The table of contents for the assessment handbook shows that each chapter has an opportunity for diagnostic assessment in the form of a pre-test and formative assessment in the form of a chapter assessment. Summative assessment is included in each unit as a performance task, such as the Unit 2 performance task How Does Regenerative Medicine Reflect Nature? Formative and summative assessments both include materials in a variety of formats. For example, the Chapter 6 assessment found in the assessment handbook includes multiple choice and short answer questions, such as "Describe the journey of a water molecule as it passes through a cell membrane, including the molecules it passes and how it interacts with them. Contrast this with the movement of a glucose molecule across the membrane." Additionally, the Unit 2 performance tasks contain a variety of formats. For example, Unit 2, Performance Task 2 requires students to analyze questions like "What are the inputs and outputs of photosynthesis?", research requirements for a paludarium, and model a blueprint for a paludarium. This variety of assessment strategies allows students to display learning in various formats.

- In addition, materials include chapters that include a variety of **informal and formal** assessments that give teachers feedback on student learning at the moment so that they can modify instructional approaches. For example, Chapter 6, Cell Structure and Function, contains opportunities for both formal and informal assessment in various formats. Section 6.1 Cell Structures contains a Visual Support section that provides an opportunity for informal formative assessment as students are placed in groups to examine an image and make their three-dimensional models of plant cells and animal cells. Additionally, materials in the chapter guide teachers to facilitate another varied opportunity for informal formative assessment in the form of a general class discussion on the topic of cellular respiration. Opportunities for formal formative assessment are included at the end of each chapter subsection in the form of Review questions. For example, the Review section in Section 6.1, Cell Structures, contains varied (multiple choice and short answer) formal formative assessment questions, such as Label each cell component as a part of a prokaryotic cell, eukaryotic cell, or both, to help assess student learning in a variety of formats.
- Materials include diagnostic, formative, and summative assessments in every chapter. The diagnostic assessment is in the form of Pre-Tests for providing teachers with information to identify gaps before monitoring progress through various formative assessments to identify learning gains. Each chapter has a summative task as chapter assessments .For example, in Chapter 2, Section 1, the materials list the course objectives and move into a pre-test to identify gaps and misconceptions concerning ecological systems. The pre-test includes six questions, such as “True or False? Organisms higher in a food web consume all organisms lower in the food web?” The section continues to progress in complexity, where there are a variety of assessments to identify learning gains and misconceptions before getting to the summative assessment task. For example, the materials provide review questions using various DOK. Such as, “Explain how a community is distinct from an ecosystem.” Chapter 2 concludes with an Evaluate section which provides the entire chapter review in multiple-choice format. Such as, “Which claims are true for all the organisms within a community? Select all correct answers.” The chapter ends with a Chapter 2 assessment, serving as the summative assessment for the chapter. The assessment has a Review Key Concepts section, which consists of 10 multiple choice questions, followed by three short-answer writing tasks about system models, scale, proportion, and quantity, followed by energy and matter to assess the student’s understanding of concepts and themes as it pertains to the unit.

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

- Materials include chapter assessments in the teacher materials that assess all student expectations over the breadth of the course and indicate which student expectations are being assessed in each assessment. For example, Chapter 2 Assessment lists the science and engineering practices (SEPs): 1.F, 1.G, 3.A and the Texas Essential Knowledge and Skills (TEKS): 11.A, 13.D.
- Additionally, Chapter 6 contains a TEKS/ELPS overview page that details that TEKS 5.B “compare and contrast prokaryotic and eukaryotic cells, including their complexity, and compare and contrast scientific explanations for cellular complexity” that will be assessed in Chapter 6. The Chapter 6 assessment contains TEKS-aligned questions like “Describe the functions of the

nucleus. How do prokaryotic cells fill this role in the absence of a nucleus?" to properly assess all student expectations taught in Chapter 6.

- Materials include unit overviews in the teacher materials that indicate which student expectations are assessed. For example, the Unit 2 overview shows the TEKS progression and vertical alignment to student prior knowledge in grades 6–8 as well as the TEKS that will be assessed in each chapter in the Unit activity and in each of the performance tasks. The bottom right-hand corner of the Unit 2 overview details which student expectations are assessed by showing that Chapter 5 assesses TEKS 5.A, 7.A, and 11.B; Chapter 6 assesses TEKS 5.A, 5.B, 5.C, 11.A, and 11.B; and Chapter 7 assesses TEKS 5.B, 6.A, 6.B, 6.C, and 7.B. The Unit 2 activity is listed for assessing TEK 5.B. Performance Task 1 assesses TEKS 6.A and 6.B, Performance Task 2 assesses TEKS 11.A and 13.B, and Performance Task 3 assesses TEKS 5.A. In this way, materials detail which student expectations are assessed in each learning activity.

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

- Materials include assessments integrating scientific concepts, science, and engineering practices through performance tasks. At the end of each unit, the materials provide performance tasks that combine content and SEPs. For example, in the Unit 1 performance task titled How does a Sudden Disturbance Change an Ecosystem, the project "provides an opportunity for students to demonstrate their mastery of interpreting and analyzing data to draw connections between characteristics of organisms and the role they play in the ecosystem . . . ." Students interpret data, conduct research, identify patterns and make predictions about ecosystem disturbances that students learned in prior chapters. Another example can be found in the Unit 2, Performance Task 1 titled How Does Regenerative Medicine Reflect Nature, which integrates the scientific concepts of explaining the importance of the cell cycle to the growth of organisms, including stages of the cell cycle and deoxyribonucleic acid (DNA) replication models (TEKS 6.A) and explaining the process of cell specialization through cell differentiation, including the role of environmental factors (TEKS 6.B) with varied scientific and engineering practices (SEPs). In this performance task, students will integrate their knowledge of the scientific concepts with SEPs to research regeneration in organisms, develop models to illustrate how mitosis proceeds during the regenerative process, and communicate the information collected as a visual or oral presentation.
- In addition, materials include assessments integrating scientific concepts and science and engineering practices through chapter investigations. For example, in Investigation A, Comparing Genetic Information Among Organisms, located in Chapter 14, students engage in practices and concepts regarding TEKS 2.B, 3.B, 3.C, 7.A, and 9.A while integrating SEPs. Students will:
    - Analyze data by comparing nucleotide sequences and amino acid sequences to determine relationships among various organisms.
    - Organize data on the differences between nucleotide sequences and amino acid sequences among the organisms.
    - Construct a graph of the data to communicate patterns of evidence for relationships among various organisms.
- Furthermore, materials include chapter assessments, integrating scientific concepts and science and engineering practices. For example, the Chapter 5 assessment integrates the scientific concepts from TEKS 5.A, 7.A, and 11.B with scientific and engineering practices (SEPs) in varied short answer questions on the assessment. Students integrate knowledge of scientific concepts

and the Construct an Explanation SEPs to answer the question, “Is it possible for a molecule to have covalent and ionic bonds? Explain. Give an example to support your reasoning.” Additionally, other SEPs, like Argue From Evidence and Use a Model, are integrated with scientific concepts to answer assessment questions like “short phospholipids can form spherical structures called micelles in water. Explain why phospholipids adopt this arrangement.”

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

- The materials include assessments that require students to apply knowledge and skills to novel contexts through chapter investigations. In Chapter 3, students learned about ecological relationships, biodiversity, and ecosystem stability. In Investigation A, Measuring Biodiversity Using Ecological Sampling Methods, located in Chapter 3, students apply knowledge of biodiversity to “survey an area on school grounds . . . to determine plant biodiversity.” Students make observations and collect data and calculate the diversity index.
- In addition, materials include performance tasks, which require students to apply knowledge and skills to novel contexts. For example, in Unit 2, Performance Task 3, titled How Are Complex Carbon-Based Molecules Built from Simple Atoms, students apply their knowledge and skills of molecules in living systems to design a game that satisfies a set of criteria and constraints and that models the process of building up and breaking down biological macromolecules.
- The materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem with MiniLabs. In Chapter 2, students learn ecological systems, modeling the transfer of energy, and modeling energy and matter distribution. In the Chapter 2 MiniLab titled Model a Biomass Pyramid, students apply their learning of biomass to use mathematical models to represent how energy stored in biomass moves through an ecosystem. Students collect and organize data into graphs, calculate biomass transfer, and apply their calculations to their learning: “Can this ecosystem support a higher level consumer . . . ?” and “What happens to the biomass that does not move on . . . ?”.

Cengage Learning National Geographic
Biology, Texas Edition

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 partially meet the criteria for this indicator. Materials include some 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 Looking at the Data activities containing follow-up suggestions for formative assessments and examples of acceptable answers for evaluating student responses. For example, the Chapter 5 Looking at the Data activity, Digestive Enzymes and pH, requires students to analyze patterns in the data and identify the pH level at which different enzymes are most active. Teacher guidance is provided in the sidebars of the Teacher Edition text as sample student responses, like "Sample answer: A person who experiences lactose intolerance should avoid foods that contain the disaccharide sugar found in dairy and milk-based products or add lactase enzyme drops or tablets when they consume those products," is provided to help teachers evaluate student responses. Additionally, Chapter 6, Looking at the Data activity titled Microbiota of the Human Body, also guides the form of sample student responses, like "Sample answer: Bacteria are found in largest numbers in the digestive tract so they must play an important role in digestion and excretion," in the sidebars of the teacher's edition text.
- Materials include performance tasks, which include resources that guide teachers in evaluating student responses through scoring rubrics. For example, Unit 2 Performance Task 1, titled How Does Regenerative Medicine Reflect Nature?, requires students to research the process of regeneration, develop models to illustrate how mitosis proceeds during the regenerative

process, and communicate the information collected as a visual or oral presentation. This performance task includes a scoring rubric for teachers to evaluate student responses as either (1) approaching, (2) succeeding, or (3) excelling, based on students' ability to research, model, and communicate explanations. This rubric defines Excelling models "as models accurately identify and describe the components of the cell relevant to illustrating the role of mitosis and differentiation in biological regeneration," which would give students a perfect score for one category of the performance task. In addition, the Assessment Handbook, located in the teacher materials and Ancillary Materials, includes rubrics for pretests, assessments, and performance tasks. For example, in Unit 1 Performance Task 4, the rubric for excelling states, "visual representation of food web is clear and engaging."

- Furthermore, materials provide rubrics for investigations. For example, Chapter 16, Investigation A, provides a rubric that lists the category being graded and three different levels of achievement possible (Excelling / Succeeding / Approaching). The Chapter 16 Gathering Data section lists excelling as "All data on the environmental changes, variations, and new species were accurately recorded and detailed during the simulation." In contrast, it lists the approach as "Data on the environmental changes, variations, and new species were not consistently recorded during the simulation."

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.

- Materials include assessment tool add-ons such as MindTap that yield data teachers can easily analyze and interpret. The materials allow teachers to sort the grade book by overall grades according to the Help Menu for Gradebook Display Settings on the Cengage Mind Tap Instructor Help website. The materials provide View Analytics in the Help Menu-Grades and Scores, where teachers can view scatter plot charts correlating your students' performance with engagement, time spent or activities opened. The materials state these "can indicate overall class performance and help you identify students whose performance is significantly above or below the average . . . ."
- Materials include English Language Learners (ELL) sections that support teachers' analysis of assessment data with some guidance and direction to respond to individual students' needs, in all areas of science, based on appropriateness for the developmental level. For example, Section 6.1, Cell Structures, has an ELL section that helps teachers respond to the unique needs of emergent bilingual (EB) students by providing a differentiated three-column chart activity based on various levels of English language proficiency. In this activity, students work to complete the chart as they read text. Teachers are guided to have beginning EB students draw the structure and write a word or two to describe the function, Intermediate EB students identify the organelle and write a short phrase, and Advanced/Advanced high EB students write detailed notes about the structure and function of each organelle. While there is guidance to teachers on how to respond to individual student needs, there is no clear support for teachers' analysis of assessment data based on measures of student progress appropriate for the developmental level.
- In addition, materials include Differentiated Instruction sections in the teacher's edition that support teachers in responding to students' individual needs. For example, Section 6.2, Cell Membranes, has a Differentiated Instruction section that provides teacher guidance to address the individual learning needs of struggling students and advanced learners. In this section,

materials prompt teachers to help struggling students differentiate between the vocabulary words hypertonic and hypotonic by guiding them in a discussion about how the prefix hyper means higher or above normal.

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

- Materials provide informal assessment opportunities which yield relevant information to teachers when planning instruction, intervention, and extension. These informal assessments come in the form of review question sets, which can be found in every chapter. For example, Chapter 14, Section 1 discusses lines of evidence. The section includes a set of review questions concerning the chapter. The teacher's edition gives sample student responses and the questions' DOK level (2). The review clarifies student mastery for the teacher to plan and provide differentiated learning experiences. Additionally, in Chapter 5, Section 3, the online materials include review questions with sample answers for instructors. The questions show the DOK levels (2, 3) to give further knowledge concerning the students' mastery levels. This allows instructors to better understand how to proceed with future concepts.
- Materials include Differentiated Instruction sections in the teacher's edition that provide relevant information for teachers to use when planning instruction, intervention, and extension. For example, Section 5.4, Chemical Reactions, has a Differentiated Instruction section that guides teachers to plan additional instruction for struggling students and advanced learners in response to an informal assessment of students viewing and discussing a diagram in the text. In this section, teachers are prompted to plan intervention by having struggling students work in pairs to develop an analogy that shows how enzymes function in biological systems. Additionally, teachers are prompted to plan an extension by having advanced students identify at least five enzymes in the human body and what happens when these enzymes misfunction. In this way, teachers are prompted by materials to plan intervention and extension based on a class discussion about how the enzyme returning to the original state is useful in biological reactions.
- In addition, materials include ELL sections in the teacher's edition that helps teachers when planning differentiated instruction**.** For example, Section 5.4, Chemical Reactions, contains an ELL section that allows teachers to plan differentiated intervention and instruction in the form of a discussion about possible sources of pollution and greenhouse gasses in their community based on individual student levels of English language proficiency. In this section, teachers are guided to have beginning emergent bilingual (EB) students, students taking turns expressing their ideas using the provided sentence stems, like “I think_____in our area cause pollution.” Additionally, teachers are guided to have intermediate EB students express their opinions and agree or disagree using provided sentence stems, such as, “I think _____ causes pollution because_____.” Lastly, teachers are guided to have Advanced/Advanced High EB students express their opinions and support them with reasons and evidence, with provided sentence stems, like “One reason is _____. I see/read/know that_____.”
- The information gathered from the assessment tools helps teachers when planning core science instruction. For example, Section 11.1, Genetic Information, contains an Explore/Explain section that instructs the teacher to use the pre-test questions 1 and 2 to identify gaps in background knowledge or misconceptions. In addition, the materials include a usage report that indicates when students log into lessons and spend time on content, as well as their scores compared to the rest of the class. Mind Tap analytics, an add-on to the curriculum, provides information to

use when planning instruction, intervention, and extension by giving teachers information about individual student engagement in each component and their mastery of each standard, supporting teachers in making critical decisions on individualizing student supports. The teacher needs to analyze the data chart and apply it to planning.

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

- Materials include Differentiated Instruction sections in the teacher's edition, providing various resources and teacher guidance on leveraging different activities to respond to student data. For example, Section 7.2, Mitosis, has a Differentiated Instruction section that provides a variety of resources for struggling students and advanced learners to help teachers respond to informal assessment data, like class discussions, in which students have difficulty distinguishing between homologous chromosomes and sister chromatids. This material provides teacher guidance to allow struggling students to understand the difference between homologous chromosomes and sister chromatids by "working in pairs . . . to create a model of a homologous pair of chromosomes and sister chromatids." A different form of this activity is provided for advanced learners, where teachers are guided to have students compare and contrast homologous chromosomes and sister chromatids using a Venn diagram. This Differentiated Instruction activity provides a variety of activities and teacher guidance to respond to student informal assessment data from a class discussion.
- Materials include pre-test diagnostic assessments and pre-test sidebars in each chapter subsection of the teacher's edition that provide various student resources for teachers to use in responding to performance data. The Chapter 7 pre-test provides various resources to gauge student background knowledge. For example, question 3 of the Chapter 7 pre-test asks, "True or False? Proteins are the structures that contain genes in a cell," to gauge student understanding of the location of genes in the cell in preparation for Section 7.2, Mitosis, where students learn how cells grow and divide through mitosis. Section 7.2, Mitosis, has a pre-test sidebar that provides teacher guidance to use Question 3 to identify gaps in background knowledge or misconceptions to respond to student data by helping address gaps in student learning before starting the chapter subsection.
- In addition, materials include chapter reviews that provide various resources for teachers to respond to performance data. For example, the Section 2.1, Review, located in the teacher's edition requires students to distinguish, classify, sequence, and synthesize concepts directly related to the chapter section. Students learn about ecological systems and practice by labeling each ecosystem component as a biotic or abiotic factor or constructing a model of the hierarchy of ecological organization. Your completed model should have six levels.

Cengage Learning National Geographic Biology, Texas Edition

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.

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

Evidence includes but is not limited to:

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

- Assessments contain items that are scientifically accurate, avoid bias, and are free from errors.
    - For example, the Chapter 5 assessment located in the assessment handbook in the teacher's edition contains questions, like “Which statement best describes the difference between a covalent bond and an ionic bond?” that aligns with the Section 5.1 objective, “Explain different kinds of bonds between atoms.” Additionally, the Chapter 5 assessment avoids bias by providing questions related to molecules in living systems that have appropriate background information, such as “lactase is an enzyme that helps the body break down lactose, a sugar found in milk, into glucose and galactose,” for students of any background to understand. The Chapter 5 assessment is also free from errors in spelling, labeling of units, and scientific terminology.
    - For example, the Chapter 3 review in Unit 1 of the teacher's edition provides the correct answers and explanation/sample answers. The items aligned with the chapter’s objectives of ecological relationships, biodiversity, and ecosystem stability and change. For example, question 11 asks students, “Why would it be important to track a keystone species in an ecosystem under threat of ecological disturbance?” which aligns with ecosystem stability. Materials avoid bias in question items by either giving context or using academic vocabulary to elicit student responses. For example, question 1 asks, “Which statement correctly describes how a habitat differs from a niche?”.
    - For example, Investigation A: Factors Affecting Cellular Respiration, located in Chapter 6 in Unit 2, requires students to investigate factors that affect productivity in yeast and

respond to analysis questions such as “Which beaker and test tube combination had the highest gas production? Why might this have been the result?” These analysis questions align with the Chapter 6 objective, describe the processes involved in cellular respiration and ATP synthesis, and contain scientifically accurate information that avoids bias and is free from error.

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

- Assessment tools use clear pictures and graphics that are developmentally appropriate.
    - For example, in the Chapter 6 assessment located in the assessment handbook in the teacher's edition of the *HS Biology TX Edition*, question 13 requires students to analyze a labeled diagram of a cell to answer the question “What type of cell does the figure show?” The image for question 13 is a developmentally appropriate color image of a cell with various labels to cell structures, such as the vesicles, vacuoles, and mitochondrion. Additionally, question 15 of the Chapter 6 assessment shows another developmentally appropriate, colored figure that shows four consecutive steps of a cellular process occurring across the cell membrane to help students identify and describe the process by which the cell can selectively bring molecules into the cell.
    - For example, in the Tying It All Together activity in Chapter 3 titled Where There’s Smoke There Is Fire in the Student Edition of *HS Biology TX Edition*, the picture displays growth after a fire for students. The graph clearly shows the changes in biodiversity with colors and a legend and does not contain excessive detail that would overwhelm high school students.
    - For example, the Chapter 5 Looking for the Data assessment activity titled Digestive Enzymes and pH, located in Chapter 5 of the Student Edition of the *HS Biology TX Edition*, contains a developmentally appropriate graph of various enzyme activity at different pH levels. This graph shows four different enzyme graphs, each represented by a different color, with a clear key to match the graph color to the enzyme name, a clear graph title, Digestive Enzyme activity and pH, and clear axis titles. This graph allows students to see the activity of each enzyme to answer analysis questions.

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, in the Chapter 11.2 Evaluate section in the teacher's edition of the *HS Biology TX Edition*, teachers “use Figure 11-15 to convert the codons into amino acids. (lt) threonine; (lb) glycine; (rt) glutamic acid; (rb) leucine." Additionally, the Visual Support sidebar in Chapter 11.2 provides more guidance for this assessment: “Ask students to identify the polysomes and the mRNA in Figure 11-15 and explain how they made their identification. Ask students how polysomes can be an advantage to the cell.”
    - For example, the Unit 1 performance task titled Why Should We Preserve Wetland Ecosystems, located in the Chapter 2 planner of the *HS Biology TX Edition*, provides recommendations for administration, the outline of the task, preparation, sample answers for each component, a rubric, and links for additional support. The materials state the assessment item should be a minimum of three 50-minute periods; additional time as needed for research and preparation of presentations. In addition, the rubric

and outline provide the teacher with detailed information. For example, the rubric states, claims about the cycling of matter and energy flow fully include ideas that (a) matter flows between environment and organisms for Excelling students.

- For example, Chapter 15, Evolution of Antibiotic Resistance in Bacteria Investigation, located in the *Teacher's Ancillary Lab Manual TX*, outlines the time to administer each investigation step. The materials state the total time of the investigation is Three days, 115 minutes and the breakdown by Day 1: Set up the investigation (50 mins), Day 2: Make and record observations (15 mins), Day 3: Make and record observations; finish the investigation, clean up, and analyze results (50 mins). In addition, the materials provide teacher guidance in the form of preparation instructions, sample answers to pre-laboratory questions, facilitating the investigation instructions, cleanup instructions, and sample answers for analysis and conclusion questions. This guidance helps teachers to efficiently administer and facilitate the investigation by providing specific instructions that are complete and easy to follow. Furthermore, online materials provide detailed information to support the teacher in scoring student investigations by providing a detailed scoring rubric, and sample student answers to analysis and conclusion questions.
- For example, Chapter 15 assessment located in the assessment handbook in the teacher's edition provides fifteen questions for teachers to preview and an answer key including sample questions for open-ended critical thinking questions: For example, "11. Sample answer: Biology is the study of living things. All organisms have traits that make them uniquely suited to their natural environment. The theory of evolution helps explain how and why these traits developed and how they may continue to evolve in response to environmental changes."

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

- Materials offer accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals.
  - For example, the *IAC Cognero HS Biology Student Edition*, located in the teacher materials Home Page under Course Resources, allows teachers to create assessments with fewer questions for students with this accommodation. This function allows teachers to modify the question bank.
  - For example, the online version of all chapter assessments in the Student Edition of *HS Biology TX Edition* has a text-to-speech function allowing students to select the text they would like to read aloud. In the Chapter 5 assessment, students can use their mouse cursor to hover over the text and press a speaker phone symbol to convert text into a digital text read aloud. As the text is read aloud, a blue box appears around the word being read, allowing students to easily track and follow along. Alternatively, students can click the Accessibility button in the top-right-hand corner, which gives options for the accommodated features, such as zoom in/out and read aloud, in which students can choose to listen to this page, and have the entire page converted into a digital text read aloud.
  - For example, chapter investigations provide accommodations for remote students. In Chapter 11 Investigation A in the teacher's edition of *HS Biology TX Edition*, students use building blocks to model the process of protein synthesis from a given DNA sequence.

Teachers are guided in a section labeled “Accommodations - The following tips will help you facilitate this investigation for students in distance/online learning or to help students perform a version of the investigation at home. If a student cannot access building blocks, they can use any set of different colored materials, such as beads on a string. You can provide a key for students who are struggling with the identification of different amino acids.”

- For example, materials present suggestions to help struggling students and advanced learners in the Differentiated Instruction| Leveled Support boxes. For example, in the Differentiated Instruction section in Chapter 15.3, located in the teacher materials of the *HS Biology TX Edition*, the struggling-students suggestion is have students add a real-world scenario to an image to help provide context for the process being modeled, while the advanced-learners suggestion is consider how the founder effect is similar to and different from the bottleneck effect described in Figure 15-16.

Cengage Learning National Geographic
Biology, Texas Edition

Indicator 7.1

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

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

Meets| Score 2/2

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

Materials provide recommended targeted instruction and activities to scaffold learning for students who 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 based on targeted areas students still need to achieve mastery. Each chapter planner includes Vocabulary Strategy sections. For example, the Chapter 2 planner includes a Word Families activity, a Latin Roots activity, and a Root Words activity to guide teachers by providing scaffolds for students to break down complex scientific vocabulary. The materials also include Address Misconceptions sections. In Section 2.3, the materials guide teachers in outlining student misconceptions and how to scaffold learning to rectify their mental models. For example, the materials recommend that teachers clarify what conserve means in terms of energy and rectify mental models. It may be useful to describe how specific forms of matter accumulate at higher trophic levels and contrast that with energy, which is lost by heat.
- In addition, materials include English Language Learners (ELLs) sections that provide recommended targeted instruction and activities to scaffold learning for students who have not yet achieved mastery. For example, Section 5.3, Carbon-Based Molecules, located in the teacher's edition, contains an ELLs section that provides recommended targeted instruction for each level of language acquisition. This section offers scaffolding questions that teachers can use to promote student discussion, such as "Are hydrocarbon chains reactive?" for beginning ELLs, "What are hydrocarbon chains?" for intermediate ELLs, and "Why can carbon atoms form hydrocarbon chains?" for advanced/advanced high ELLs.
- Furthermore, materials include Differentiated Instruction sections that provide targeted instruction and differentiated instructional approaches for struggling students. For example, Section 5.3, Carbon-Based Molecules, located in the teacher's edition, contains a Differentiated

Instruction section that requires the teacher to read the text and describe nucleotides and nucleic acids, referencing a diagram of nucleotides and nucleic acids. Then, students work in groups to identify the parts of the structure of a DNA molecule. This activity provides targeted practice on differentiating nucleotides and nucleic acids for students who have yet to achieve mastery. Differentiated Instruction sections also include hand gestures, visuals, or concrete objects to support science vocabulary and concept development. For example, in the Section 11.1 Differentiated Instruction section, teachers are prompted to provide students with manipulatives to create a kinesthetic-tactile experience as they build a model of DNA. Students can work in pairs or groups to label each part of the model. Students are encouraged to practice pronouncing each word as they label the model.

Materials provide enrichment activities for all levels of learners.

- The materials provide enrichment activities for all levels of learners in chapter planners. For example, The Chapter 3 planner provides a table for each section with instructional support for all learners. The materials guide teachers to provide activities and resources for social-emotional learning, ELLs, vocabulary strategy, connecting to language arts, revisiting the unit phenomenon, engaging in your community, connecting to careers, differentiated instruction leveled support, and more. The activities provide opportunities for cross-curricular application, research tailored to student needs, and ways to encourage further exploration of science. For example, in the Differentiated Instruction Leveled Support section located in the National Geographic Explorer Federico Kakoliris: Restoring a Critically Endangered Frog Population in Chapter 3, the materials guide struggling students and advanced learners through their research of habitat destruction.
- In addition, the National Geographic Explorer sections include a variety of real-world scenarios students can explore based on their interests in particular areas of science or community needs. For example, the National Geographic Explorer Camila Espejo: Finding Clues to Diagnose Cancer Before it Spreads section in Chapter 7 provides enrichment to the chapter topic of cell growth by allowing students to engage with real-world examples of how a scientist is finding clues to diagnose cancer before it spreads. This activity enriches students in unregulated cell growth and provides a real-world example of the impact, research, and potential solutions to unregulated cell growth (cancer) in Tasmanian Devil populations.
- Materials provide authentic videos throughout chapters that provide teacher guidance to extend learning for students at all levels. For example, Chapter 15 guides teachers to Use Video 15-2 to show students various examples of Darwin's finches in their habitats and, in particular, see how the woodpecker finch uses tools to help it gather food.

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

- Materials include Differentiated Instruction Leveled Support sections for each chapter, providing scaffolds and guidance for just-in-time learning acceleration for all students. For example, in Section 4.3, students learn about limiting factors. The Differentiated Instruction Leveled Support section guides teachers in differentiated instruction for struggling students and advanced learners. The different activities provide content to be delivered in a moment of need or to accelerate learning. Later, teachers receive just-in-time learning prompts for double-line graphs and how to assist students in engaging with the graph. The provided activities reengage ELLs through role-playing.

- Another example is the Differentiated Instruction Leveled Support section in Chapter 14. For struggling students, the materials provide the following guidance to teachers, "Working in pairs, have students use different materials to create a video storyboard or graphic art of how an organism becomes a fossil after it dies. Each frame of their art should include a description and indicate the correct sequence. For advanced learners, the materials state, "Working in pairs, have students use different materials to create a video storyboard or graphic art of how a different type of organism becomes a fossil after it dies. For example, they may choose a marine organism or an organism trapped in a material such as amber or tar. Have students write an audio script that describes the process to go with their storyboard or art. Then, record it for a presentation".
- Materials include Vocabulary Strategy activities with suggested immediate and specific feedback to help learners identify their strengths and weaknesses. For example, the Vocabulary Strategy activity in Section 5.1, Elements and Compounds, provides a scaffold for just-in-time learning by allowing students to create word posters of important vocabulary terms as they learn each new term. Students will include the key term, its definition, and an example showing the image for each poster. Then, the teacher will discuss which poster most accurately reflects the vocabulary term. This discussion provides a scaffold for just-in-time learning acceleration by allowing all levels of students to practice new vocabulary and make sense of the terms.
- Materials include ELL sections, which include prompts and cues to use with learners when they are stuck on a particular task. For example, the ELL section in Chapter 14 provides prompts and cues to use with learners for vocabulary assistance. The materials state, "Using more familiar vocabulary to explain new terms can help students understand and internalize them. For impression and cast, have students make models and write about them using accessible language. Have students press a small object into modeling clay to make an impression. Explain that when an impression hardens, it forms a mold. Have students fill the impression with quick-drying plaster of Paris, let it dry, and peel off the clay to reveal a cast." For beginning students, the materials suggest that teachers provide sentence frames for students to explain the models, such as "I press an object in to make an (impression). When it hardens, it is a (mold). Minerals fill the (impression). When they harden, they make a (cast)." For intermediate students, "Have students describe their models by writing complete sentences using the words impression, mold, and cast." For advanced/advanced high students, "Have students explain how the meanings of impression, mold, and cast are different using their models as examples."

Cengage Learning National Geographic Biology, Texas Edition

Indicator 7.2

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

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

Meets| Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials include chapter planners that provide engaging activities for students in the mastery of the content through various instructional approaches and clear guidance to support teacher understanding of developmentally appropriate instructional strategies to the course's rigor level. For example, the Chapter 2 planner includes an Instructional Support for All Learners section and an overview that guides teachers to have discussions with students to help them practice effective communication and collaboration while answering questions. Each chapter contains case studies and phenomena to engage students throughout the unit concepts. For example, in Section 2.1, students read about the relationship between bears and fish and later generate questions about trophic levels in Section 2.2. Other activities in Section 2.2 include interactive food webs, embedded support videos, Connect to Careers (National Geographic Explorer Rae Wynn-Grant), and more. The materials guide teachers to elicit student discussion and research ecotourism in Section 2.3. Other instructional approaches to engage students include a Tying It All Together activity, a guided inquiry investigation (Investigation A), and an

open inquiry investigation (Investigation B). This variety of instructional approaches allows students to engage with content authentically and make connections that enable mastery of the content.

- Materials include Front Pages, which have a variety of developmentally appropriate instructional approaches to engage students in the mastery of the content. For example, the Front Pages contain a document called Student-Centered Learning in Biology, which details the use of anchoring phenomena, case studies, connections, and biotechnology focuses to foster curiosity and engagement in all learners. Additionally, the Exploration in Biology section documents details how the Explorers at Work sections are used in all five units to sharpen students' analytical skills with exciting and interactive case studies so that they not only succeed in Biology but also become inspired to use these tools throughout their lives to better understand the world around them.
- The materials present opportunities for students to engage in challenging inquiry-based learning activities in each lesson. For example, Chapter 16 provides the inquiry-based investigation titled Investigation B, Wildlife Crossings and Corridors. This investigation challenges students to complete the following: "Research mountain lions to determine how they are affected by habitat fragmentation." The instructions guide students to develop design criteria and constraints for a wildlife crossing or corridor for a population of mountain lions, draw a model of the wildlife crossing or corridor, and propose a procedure to test the effectiveness of the wildlife crossing or corridor.
- The materials include video clips to introduce, engage, and reinforce specific science concepts and form connections to scientific concepts in the real world. For example, Video 16-3 SIMULATION: Saving the Reefs in Chapter 16 has students participate online to save the reefs. The instructions state, "Students work within the simulation to develop a decision matrix about approaches to coral reef restoration."

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

- Materials consistently support flexible grouping in all lessons through various learning experiences(e.g., whole group, small group, partners, one-on-one). For example, in the Recurring Themes section in Section 12.1, students view Figures 12-2 and 12-3 and then make their own duplicated chromosome, to reaffirm their understanding of the replication process. Students then gather in small groups to discuss how to recreate an exact copy of the DNA on the chromosome they created. They repeat the process using a duplicated chromosome. Materials suggest flexible grouping targeted for applying Science and Engineering Practices (SEPs). For example, Section 5.1 includes a Scientific and Engineering Practices section that provides an opportunity for students to read a caption about an electron cloud individually, participate in a whole-group discussion about why the electrons are illustrated as a cloud, and then work in pairs to draw models of electron clouds. In addition, Section 6.2 includes a Scientific and Engineering Practices section that allows students to work individually or in groups to make a chart where they identify each class of cellular membrane protein, draw their model, and describe how it functions with the membrane.
- The materials guide teachers on when to use specific grouping structures based on the needs of students. For example, the case study Sharing our City in Chapter 4 guides teachers to have English Language Learners (ELLs) students work in pairs to write a summary. Later in the National Geographic Explorer: Heather Lynch section, the materials guide teachers to use mixed groups with ELLs. Additionally, Section 5.4 includes a Differentiated Instruction section and

provides grouping suggestions to support struggling students and advanced learners. The Differentiated Instruction section suggests that struggling students should work in pairs to develop an analogy that shows how enzymes function in biological systems. Still, advanced learners should work individually to identify at least five enzymes in the human body and what happens when these enzymes malfunction. The materials direct individual students or student groups to share their findings with the whole group.

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

- Materials provide multiple types of practices (e.g., modeled, guided, collaborative, independent), guidance, and structures to achieve effective implementation. For example, Investigation A, Converting Carbohydrates, in Chapter 5 supports guided learning as students follow a procedure, modeled learning as students use this investigation to represent their core concept of enzyme activity in various environments, and collaborative learning as students work in groups to conduct the investigation. This investigation guides teachers in the advanced preparation of lab materials and in a pre-laboratory discussion about what indicators are to promote effective implementation.
- In addition, the Visual Support section in Section 11.3 provides independent and collaborative types of practices. The materials instruct the teacher to walk the students through Figure 11-22, titled Eukaryotic Gene Regulation, by breaking it down into steps. Students independently read the textbook sections on gene regulation and then discuss the information in the diagram with a partner.
- Materials include case studies that consistently support multiple practices and provide guidance and structures to achieve effective implementation. For example, the case study Where There's Smoke There is Fire in Chapter 3 guides students to ask questions independently. In Section 3.3, students revisit the case study to apply the intermediate disturbance hypothesis to the real-world Yellowstone fire. The materials guide teachers to engage students in a discussion about biodiversity and the disruptions of fires. Additionally, the case study Turning Molecules into Medicine in Chapter 5 supports multiple practices by enabling students to participate in independent, guided, and collaborative learning practices as they identify and discuss "how molecules . . . are being used to develop new medicines." This case study provides implementation support to teachers by guiding teachers to ask students to identify common molecules humans ingest and generalize the discussion about the use of molecules in medicine. Furthermore, case studies allow students to complete a reflection assignment independently. For example, the case study Tracking Tuskless Elephants in Chapter 16 directs teachers to have students consider why elephants without tusks would have different diets than elephants with tusks. The materials tell teachers, "Students should revisit the case study as they read the chapter to make connections with the content."
- The materials provide multiple types of practice, including metacognitive structures, for English Language Learners (ELLs) in the Acquire English worksheets. The worksheets differentiate tasks based on the level of ELLs and include working in pairs, collaboratively, and independently. The metacognitive structures provide word-processing strategies and guide ELLs through words and the thinking processes to read and say them.

Cengage Learning National Geographic Biology, Texas Edition

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

- The materials contain National Geographic explorers representing a diverse group of scientists and engineers representing genders, races, ethnicities, abilities, religions, and national origins. The Front Pages of the teacher's edition materials list these diverse groups of explorers with their names and careers. The materials used by these explorers are in the National Geographic Explorers sections. For example, the Unit 2 National Geographic Explorers sections introduce three scientists, Rosa Vásquez Espinoza (Chapter 5), Andrian Gajigan (Chapter 6), and Camila Espejo (Chapter 7), showing diversity in the gender of the highlighted scientists. Additionally, each of these scientists has a unique role in science, like extremophile biologist, wildlife veterinarian, and marine virologist, showing that diversity extends to the jobs of these scientists. Lastly, the locations are diverse as these scientists conduct research in different places, such as the Amazon, the Philippines, and Tasmania.
- Materials include On Assignment sections representing diverse communities in the images and information about people and places. For example, the Section 5.3, On Assignment section, highlights a farmer from the Peruvian Andes holding a basket of oca. This page details that oca is a tuber and shares similarities with other tubers, like potatoes, but oca is the second most highly cultivated tuber on the planet and is high in protein. In addition, the Section 8.4, On Assignment section shows an Italian woman during the height of the Covid-19 Pandemic. These On Assignment sections highlight different communities and experiences of the biological concepts students are learning.
- Real-world examples and connections in the materials represent diverse communities and places, including rural, urban, and suburban communities, cities, and states across the U.S. and worldwide. For example, in the In Your Community: Epigenetics and 9/11 section in Section 11.3, information is given about the women who were around the World Trade Center during 9/11. The experiences of women over six months pregnant caused them to develop post-traumatic stress disorder, with low cortisol levels, and their babies also had low cortisol levels. This discussion includes implications of epigenetics for communities that experience stressful events.

Cengage Learning National Geographic
Biology, Texas Edition

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 English Language Proficiency Standards (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 (i.e., 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 teacher's edition eBook includes guidance for linguistic accommodations commensurate with various levels of English language proficiency as defined by the ELPS. Each chapter includes multiple sidebars of English Language Learners (ELLs), where materials guide the teacher in ELPS and provide accommodations and scaffolds based on the level of language acquisition (Beginning, Intermediate, Advanced/Advance High). For example, in Section 3.1, the ELLs sidebar guides teachers for beginning students to draw an organism's habitat and niche and for intermediate students to draw a picture and then use "these sentence frames to describe it . . . ." Another example is the ELLs sidebar located in the Chapter 6 case study Artificial Cell Technology that provides guidance to teachers for linguistic accommodations based on ELPS 4.A. This section provides accommodations and scaffolds based on level of language acquisition (Beginning, Intermediate, Advanced/Advance HIgh) as students work to underline and define the following Spanish cognates as they read the case study: bacteria, artificial, synthetic, natural, and proteins. Materials provide linguistic accommodations and teacher guidance as beginning EBs work together to list matching cognates in their native language and English and use a dictionary to define them, intermediate EBs "use each cognate in a written sentence that shows its meaning . . . and trade sentences with another pair to check," and advanced/advanced high EBs explain what they learned about each cognate from reading the case study.

- In addition, the ELLs sections provide multiple opportunities for meaningful engagement with content, spiraling concepts and vocabulary for repeated practice, and using paraphrasing techniques for internalizations. For example, the ELLs section in Chapter 15 provides directives for ELPs 1. C: Vocabulary Strategies: Students must regularly review new vocabulary to internalize and fully understand it. After students read this part of the text, review the terms directional selection, disruptive selection, and stabilizing selection.
- Materials include the Acquire English Worksheets in the ELL Workbook for Acquiring English that provide sentence stems to support writing with multiple levels of complexity to reflect four tiers of English language proficiency. For example, in Worksheet 5B, beginning students read statements to classify as covalent or ionic, while intermediate students "use these sentence starts to describe covalent and ionic bonds . . . ." In addition, the Acquire English Worksheets located in the ELL Workbook suggest the use of graphic organizers to classify information, order steps in a process, or scaffold written tasks. For example, Worksheet 1B provides teacher guidance to implement linguistic accommodations for beginning, intermediate, and advanced/advanced high EB students by providing a graphic organizer with instructions as students read text. In this activity, beginning EB students fill out the graphic organizer with a classmate and write in their first language or copy sentences from the text. Intermediate EB students work with a classmate and underline details in the text that helped them. Advanced/advanced high EB students compare their chart with a classmate's and add any details they missed.

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

- The materials include ELLs sidebars of the teacher's edition ebook that encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English by encouraging the use of the student's native language. The materials include tips for teachers about allowing students to express their understanding in their first language. For example, in Section 4.3, in the ELLs sidebar, the materials instruct teachers to allow emergent bilingual students "to share opinions in their native language, and help each student translate their opinion . . . ." Another example is the ELLs sidebar in 16.1. The materials state for Beginning students, "Have students mark words they do not understand and ask: What does _____ mean? Allow students to discuss the text in their native language if needed. Encourage them to ask for the corresponding English words: How do you say _____ in English?"
- In addition, materials include an ELL Workbook for Acquiring English and Acquiring English Worksheets that encourage strategic use of students' first language for linguistic, affective, cognitive, and academic development in English. For example, Acquiring English Worksheet 2C allows beginning EB students to make sense of new chapter vocabulary by writing definitions in their first language and then adding in pictures and notes later. Creating a personal dictionary allows students to strategically use their first language to develop linguistically, affectively, cognitively, and academically in English.
- Furthermore, the teacher's edition includes additional guidance to teachers to encourage strategic use of students' first language for linguistic, affective, cognitive, and academic development in English. For example, in the Vocabulary Strategy activity in Section 9.3, the teacher prompts students to start an interactive word wall just for terminology related to flower parts, as students often get confused and have trouble remembering the difference between

the anther and filament or the stigma and style. Students must list each word in Figure 9-14 and add definitions, images, or phrases to help them remember the words. Students are to also indicate the relationships between the structures and how they work together. Students less proficient in English are encouraged to post notes in their primary language.

- The *Custom eBook: HS Biology, Student Edition TX* includes a glossary with cognates and definitions in Spanish under the English terms and definitions. For example, the text contains the Spanish terms “factor abiotico,” “acido,” and “sitio activo” under the English terms “abiotic factor,” “acid,” and “active site” definitions for each term.

Cengage Learning National Geographic Biology, Texas Edition

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 for this indicator. Materials provide guidance on fostering connections between home and school.

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

Evidence includes but is not limited to:

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

- The materials provide information to be shared with students and caregivers about the design of the program in the Contents in Brief and a Contents section in the Student Edition. For example, the Contents in Brief section provides the design of Unit 3, which covers Chapter 8, Diversity of Living Systems; Chapter 9. Plant Systems; and Chapter 10, Animal Systems. Additionally, the Contents section in the Student Edition provides the design of Chapter 10, which includes Sections 10.1, Animal Diversity; 10.2, Defining Animal Systems; 10.3, Maintaining Homeostasis, 10.4, Animal Behavior; the MiniLab Comparing Reaction Speed; the Looking at the Data activity Thermoregulation; the Tying it all Together activity The Incredible Nonstop Flight of the Bar-Tailed Godwit; and the chapter review.
- In addition, materials include a Student-Centered Learning in Biology document that provides information to be shared with students and caregivers about the design of the program. For example, the first paragraph of the Student-Centered Learning in Biology document describes the general layout of the materials as each unit is built around an Anchoring Phenomenon that students revisit as they learn. This design aims to foster curiosity and engagement for biology concepts using case studies, connections, and biotechnology focus features that prompt reflection and lead to Tying It All Together at the end of each chapter. Additionally, in the Diversity and Inclusion section of the Student-Centered Learning in Biology document, further design purpose is described as the author, Dr. Catherine Quinlin, details the goal of the materials to address the needs of all populations and to reflect the demographics of who will be tomorrow’s scientists. The overall intention of the program's design is shared in the final

paragraph of the Student-Centered Learning in Biology document, as Dr. Catherine Quinlin describes the purpose of various embedded discussion prompts to help encourage student engagement and active learning.

- Furthermore, the materials provide a Quick Tour button at the top of the Student Edition that links to a video detailing how authors designed the Cengage E-Reader and how students will access various resources throughout the text to get the most out of their e-reader. For example, the video explains how key terms are bold throughout the text. When students click on the highlighted term, the definition will be visible. The video continues to describe various features of the e-reader. It explains the accessibility icon and the functions of it. At the end of the video, a link to more videos for training are available to the student or parent.

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 the caregivers in the Biology Caregiver Resources. The Caregiver Resources includes a guide on what students access on the website, as well as key topics for the unit. For example, Unit 2 Cell Systems, the materials prompt the parent "In this unit, your student will learn about cells throughout the study of molecules in living systems and the structures and functions of cells, as well as how they grow."
- Additionally, materials provide at-home activities for caregivers to help reinforce student learning and development. Each chapter section for at-home texts includes ways caregivers can modify activities to meet students' developmental needs, such as modifying reading levels. For example, in Section 3.2, Biodiversity, located in Unit 1, the grade-level text in the upper right corner toggles text from Grade-Level Text to Modified Text. Materials include The Teachers Lab Manual found in the teacher materials, which recommends hands-on activities, investigations, and questions for inquiry that caregivers can use to help students make real-world connections through observing, making, designing, and testing solutions to simple problems with simple objects from home. For example, Investigation A states, "Students can conduct the entire investigation at home with a partner by using common kitchen items" and provides further accommodations to complete the lab. The provided printable worksheets (Worksheet A) include the Prelaboratory Assignment, Data and Observations, Analysis and Conclusions, and the Self-Reflection Rubric for Chapter 1 Investigation A for completion at home.

Materials include information to guide teacher communications with caregivers.

- The materials include information to guide teacher communication with caregivers in the Biology Communication Resource. The materials include different resources for the teacher to utilize with the caregiver. For example, in the Investigations and Activities, the materials prompt the teacher "You might also choose to set the materials in your classroom and have students gather a take-home setup for completion there. Encourage students to involve caregivers, siblings, or others in the home." The materials also include an exemplar beginning of school year letter to be sent home to parents which guides initial conversation about creating a partnership with caregivers. For example, the letter home states, “You can support your student's success by looking at the program with them, either in the print book or the digital version for which your student has a log-in. Thumbing through, you'll easily find the Explorers as well as the striking photographs of National Geographic Photographers that bring the content to life.”

Cengage Learning National Geographic Biology, Texas Edition

The materials include online components which could be accessed and used by caregivers. For example, the English Language Learner (ELL)Workbook for Acquiring English provides activities for ELLs to complete during class. The activities differentiate for each level and would give feedback to the caregiver. For example, on Worksheet 1B, a beginning ELL would “write in your first language or copy sentences,” and an intermediate student would “underline details in the text that helped you.” This information does not provide guidance or a template for communicating with parents. In addition, materials include chapter planners, which contains a table that provides teachers with information about the Content, Instructional Support for All Learners, and Digital Resources found in each chapter. For example, the Chapter 5 planner details that Section 5.1 contains a Vocabulary Strategy for students to contribute to a word wall. In addition, each chapter planner outlines the contents and includes MindTap resources. The MindTap resources include sample answers, lab guides, rubrics, and worksheets that provide data for student progress. These components can be used by caregivers after receiving guidance from the communication guide.

Cengage Learning National Geographic
Biology, Texas Edition

Indicator 8.1

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

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

Partial Meets | Score 1/2

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

Materials are accompanied by a TEKS-aligned Scope and Sequence outlining the order in which knowledge and skills are taught and built into the course materials. Materials provide clear teacher guidance for facilitating student-made connections across core concepts and scientific and engineering practices. Materials provide review and practice of knowledge and skills, but opportunities are not 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 are accompanied with a general Scope and Sequence on the pacing guide that provides TEKS alignment. The Pacing Guide located in Teacher Resources within the Teacher's Edition, sequences chapters and unit experiences sequentially and provides explicit reference to the Texas Essential Knowledge and Skills (TEKS). For example, the Pacing Guide contains a table that indicates that subsection 1.1: "The Study of Life," should be allotted one 0.75 class period, or 0.3 block periods, and will cover TEKS 2.B, 3.A, 5.A, and 5.C.
- The materials include a "unit overview" at the beginning of each chapter that provides the TEKS to be covered within each chapter as well as the TEKS alignment to each activity and performance task. For example, the Chapter 2 teacher's edition consists of TEKS 13.(A)(B)(C) and (D), and the Unit 1 Activity is aligned to 13.A.
- The Unit Overview also highlights the unit progression and provides the TEKS to be covered within each chapter as well as the TEKS alignment to each activity and performance task. For example, the Unit 1 Overview contains a "TEKS Science Concepts Progression" that highlights the vertical alignment of TEKS from previous years, as well as the TEKS that will be covered in each chapter of the Unit, the TEKS covered in the Unit Activity, and the TEKS covered in the Performance Tasks.
- Furthermore, within the "Chapter Planner" there is a page titled "Texas Essential Knowledge and Skills" which lists the TEKS covered within each chapter and also aligns TEKS to all case studies, subchapters, "MiniLabs," "Tying it all Together," chapter investigations, and unit performance.

For example, the teacher's edition, chapter subsection is titled "2.1 Ecological Systems" and is aligned to TEKS 13.B while subsection 2.3 "Cycling of Matter" is aligned to TEKS 13.BC.

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

- The materials provide teacher guidance for facilitating student-made connections across core concepts and each chapter contains chapter investigations. Within this section of the teacher's edition, the materials guide teachers through the connections students should make to concepts and briefly describe the concept connection. For example, in "Chapter Investigation A: Salinity and Brina Shrimp Survival," the concept connection is Scale, Proportion and Quantity. The sidebar further explains how students should consider scale in Figures 2–3.
- The "Chapter Planners" at the beginning of each chapter reference topics and suggest models and investigations for teachers to facilitate student-made connections to previous concepts or science and engineering practices. Each chapter planner contains a "TEKS Science Concepts Progression" that outlines how concepts develop across multiple grade levels.
- The material contains a scientific phenomenon that anchors each unit of study for students. Each Unit Overview provides an overview of how each unit chapter progresses student understanding of the phenomena. The culmination of this learning is in the form of a CER, located in the "unit activity." Under the heading "Revisit Unit Phenomenon," materials provide guidance to SEPs.
- The materials provide support for facilitating student-made connections across core concepts and SEPs through teacher guidance in the Teacher Edition. The materials provide teachers with targeted support for 3D instruction and cross-curricular connections to Math, English Language Arts, and other science disciplines with the recurring themes and concepts (RTCs) clearly called out at the point of use on the teacher pages. Referenced titles to support connections in the sidebars will include: "Scientific and Engineering Practices," "Recurring Themes and Concepts," "Connect to Language Arts," "Connect to Math," and "Cross-Curricular Connections." For example, in Unit 1, Chapter 2, the materials provide a cross-curricular connection to "Connect to Language Arts" where students "should write an argument using evidence from the text…."
- Furthermore, the Chapter 4 Overview found in the Chapter Opener section supports teachers in their ability to engage connections between SEPs. In the "National Geographic Explorer Daniel Streicker" section, teachers are shown how science connects to the career of an epidemiologist and supports by giving teacher prompts to different levels of English Language Learners on a real-world disease. In the boxes labeled English Language Learners, teachers are given differentiated prompts for students to make connections between science and engineering practices. There is a section in 11.1, Genetic Information, that provides teachers with differentiated instruction.

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

- Materials contain Unit Phenomena at the beginning of each unit to reference throughout a unit to provide support for student mastery and assessment. Materials suggest ways to review and practice knowledge and skills through "claim, evidence, and reasoning" at the end of each chapter in a unit of study. These activities are limited to concepts within a single unit and do not

extend to previous units or years, therefore the material does not support year-round mastery and retention.

- The materials provide review and practice of knowledge and skills spiraled throughout the unit, but not throughout the year. For example, within the Unit 2 Overview, teachers are guided to "Follow the Unit Phenomenon" with guided questions and an ending Unit Activity. Students will "Revisit the Unit Phenomenon of bacteria that live in the human gut and how that relationship benefits both." The phenomenon allows teachers to anchor a big idea throughout the unit and review milestones at the end.
- In addition, the Chapter 5 Planner provides a review and practice of knowledge and skill spiraled throughout the unit but not throughout the year. The Chapter 5 Planner materials include a question review. The embedded link for the Chapter 5 Review includes questions for students to answer that vary on the Depth of Knowledge (DOK) which is limited to the chapter, not the unit.
- Each chapter opens with a chapter pretest that activates and assesses students' prior knowledge, however, the materials do not provide teacher guidance on how the material aligns with previous years' TEKS.

Cengage Learning National Geographic Biology, Texas Edition

Indicator 8.2

Materials include classroom implementation support for teachers and administrators.

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

Materials provide teacher guidance and recommendations for the use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning.

- The materials provide guidance and recommendations to support teachers in understanding how to use the materials. For example, teachers can reference the “Teacher Edition Overview” located in the “Front Pages,” which provides diagrams that explain the function of each subsection of documents such as “Planning Your Investigations,” “Assessment Planning,” and “Additional Resources.” The materials also include guiding information for the lesson and chapter components on the “Chapter Opener, ELPS, Differentiated Instruction, and TEKS.”
- Materials include Unit Overviews that detail all included materials and suggest a timeline for activities in a unit of study. These Unit Overviews also provide guiding questions for each activity and provide recommendations to teachers on material implementation. For example, the Unit 5 Overview contains a table that organizes guiding questions for activities in each chapter. Materials include a Chapter Overview that provides teacher guidance and recommendations for the use of all materials within a chapter. The materials are organized to facilitate implementation by outlining “Unit Phenomena,” “Virtual Investigations,” “Concept

Progression," "Claim, Evidence, Review," "Planning Your Investigations," "Assessment Planning," and "Additional Resources." In addition, chapter overviews include a sequential breakdown of student tasks and questions to guide student learning. It does not guide the teacher on how or when to use each task but provides questions or tasks by chapter. For example, the Chapter 2 Overview provides information regarding students' prior knowledge, connections to recurring themes, and ways to enhance student learning.

- Furthermore, the Unit Overviews provide additional guidance and recommendations for teachers to use to support and enhance student learning through the use of their 5E instructional design. The Chapter 8 Planner, "Diversity of Living Systems," contains a table that organizes all chapters and materials into a 5E lesson cycle. The material includes all embedded resources and technology to the specific chapter content, instructional support for all learners, and direct links to the various instructional materials, videos, chapter reviews, and assessments.
- Additionally, each chapter provides teacher guidance and recommendations for research-based instructional strategies and scaffolds to support student learning. For example, the Case Study, "Sharing Our Cities," under the "English Language Learners" section, provides differentiated scaffolds for English Language Learners, which can be seen in a sidebar below the case study. Furthermore, in Chapter 8, sidebar materials provide teachers with recommendations for social-emotional learning. Furthermore, there is a sidebar that provides teacher guidance on self-awareness and responsible decision-making and connects this to how Leeuwenhoek's contemporaries viewed his work in the discovery of cells and cell theory with skepticism and recommendations for differentiated learning, found in a black box in the "8.1 Bacteria and Archaea" section.

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

- Materials include Unit Overviews that outline cross-content connections and English Language Proficiency Standards (ELPS) that explain the standards within the context of the course. For example, the "National Geographic Explorer Daniel Streicker" section in the Unit 4 Overview provides explicitly differentiated scaffolds for indicated ELPS 2.G, 2.H, and 4.K.
- Teacher guidance materials located in each unit overview include standards correlations and performance tasks for each chapter within the course.. For example, Unit 5 Overview contains a section that explains how Chapter 14 is correlated to TEKS 7.A, 9.A, and 9.B, and how each unit performance task correlates to the TEKS Unit 5 Performance Tasks, which includes Task 1: 9.A, Task 2: 7.B, 10.B; Task 3: 10.C; Task 4: 13.D; and Task 5: 13.D.
- The materials provide opportunities for cross-content instruction through guidance in the sidebars throughout the text. For example, the Chapter 14 Planner states that students will "Connect to Language Arts: Write Explanatory Text," "Connect to Mathematics" and "Model with Mathematics" during activity 14.2, "Fossil and Geological Evidence." Additionally, in Chapter 14, the sidebar includes a "Connect to Mathematics" section and describes the mathematics connections to the "Microevolution in a Tawny Owl Population" scatter plot graph and describes the importance of developing skills in gathering information from grade-level appropriate graphical representations.

Cengage Learning National Geographic Biology, Texas Edition

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

- Materials within the *HS Biology TX* course material include a Teacher Lab Manual that contains a comprehensive list of all equipment and supplies needed to support instructional activities. For example, pages 14–22 include a comprehensive list of supplies. The comprehensive list details the activities each material will be used for and sorts the components into non-consumables, consumables, living organisms, and solutions.
- In addition to the *HS Biology TX* course materials, the materials include a *Custom eBook HS Biology, Teacher's Ancillary Lab Manual TX* which provides complete lists of non-consumables, consumables, living organisms, and solutions. The materials also indicate which investigations and MiniLabs require each item on the materials list. For example, the materials indicate that agar plates should be prepared for investigations 8-B, 11-B (3), 13-B (2), and 15-B.

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

- The Teacher Lab Manual includes teacher guidance for safety practices and course-appropriate safety. For example, guidance documents instruct teachers in the proper preparation of all solutions in the "Materials List" and "Laboratory Safety for Teachers" sections. The "Student Laboratory Safety Handbook" and "Student Safety Contract" include guidance for safety practices and course-appropriate use of safety equipment and actions in the lab.
- Materials provide all "Chapter Investigations" with safety information and hazards in the form of safety symbols. For example, Chapter 5 "Investigation A" identifies safety symbols that are needed for the investigation. Teachers and students can access the "Safety Symbols" chart in the "Student Laboratory Safety Handbook" section of the Teacher Lab Manual.
- Materials include "MiniLabs" which provide teacher guidance for the preparation and storage of laboratory materials. For example, the *Custom eBook HS Biology, Teacher's Edition TX* details the Chapter 5 MiniLab that provides a "caution" warning to teachers about substances used in this MiniLab.
- In Appendix A of the *Custom eBook HS Biology, Teacher's Edition TX,* teachers can access the Laboratory Safety and Procedures. The materials provide student guidance for safety practices, such as "Working Safely in the Laboratory", "General Safety Rules", common safety symbols, and an injury and response table. Additional guidance for the teacher includes using the National Science Teaching Association (NSTA) lab safety and the importance of labs, and for teachers to review the Texas Safety Standards.

Cengage Learning National Geographic Biology, Texas Edition

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

Evidence includes but is not limited to:

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

- Materials include teacher guidance and recommendations on required time for lessons and activities within the “Pacing Guide” document located in the “Front Pages” section of the material. The materials support scheduling considerations, which include time allocations for traditional schedules (50 minutes) and block scheduling (90 minutes). Each chapter and subsection includes the recommended time for both schedules. The materials do advise that “Activities that do not require hands-on materials or preparation, such as Tying It All Together, have been built into the times for the sections they follow.”
- For example, the Pacing Guide suggests that Chapter 1 MiniLab was completed in 0.6 periods or 0.3 blocks. Another example on page 42 breaks down Investigation B into two days. The materials recommend teachers implement “Design and Solution” on day one and “Evaluate Your Solution” on day two.
- Furthermore, each unit overview provides guidance and recommendations for “MiniLabs” and “Investigations” within the unit in the form of minutes spent on the activity. For example, the “Unit 3 Overview” guides “MiniLabs” and “Investigations” for the chapter within that unit. The “Planning Your Investigations” section provides a table for time allotment per investigation or MiniLab.

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

- Materials provide explicit guidance on the strategic implementation of content in sequential order. For example, Unit 3 begins with Chapter 8, “Diversity of Living Systems; Fungi, Protist, Bacteria, Archaea, and Viruses” followed by Chapter 9, “Plant Systems” and concludes with Chapter 10, “Animal Systems.” The materials further indicate the purposeful grouping of chapters through their TEKS-aligned Scope and Sequence.
- Materials delineate the order of chapters to ensure students learn about precursor knowledge and skills first. For example, the Pacing Guide shows that “cell structure” is taught in Chapter 6 as a precursor to “cell cycle” and “cell differentiation,” taught in Chapter 7. Additionally, the materials provide TEKS progression clearly delineating the prior knowledge from previous grade levels within the unit overviews. For example, in Unit 1, the text states that “the student knows that the total energy in systems is conserved through energy transfers and transformations.” The text continues by describing how this connects to the unit's student expectations, “the student is expected to: describe how energy is conserved through transfers and transformations in systems such as food webs or photosynthesis.”
- The materials guide strategic implementation of the material using “Phenomena-based Learning” as explained in the “Student Edition Overview” section of the Front Pages teacher section. This is exemplified by the following excerpt: “Each unit of National Geographic Biology opens with a Unit Phenomenon. A Driving Question helps frame the phenomenon as something students can investigate throughout the unit. Each Chapter Review includes a section to revisit the Unit Phenomenon, giving your students a low-stakes opportunity to apply targeted Scientific and Engineering Practices in parallel with the main readings, activities, and assessments.”
- Additionally, the materials provide “Assessment Planning Performance Tasks” which outline the TEKS assessed in each task within units and where the TEKS connect to later unit components; for example, performance task 1, “Why Should We Preserve Wetland Ecosystems?” which addresses TEKS 1.G, 2.B, 3.B, and 13.ACD, and should be used after Chapter 2.

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

- The materials in the Front Pages section include a flexible Pacing Guide that teachers can complete in one school year. For example, the Pacing Guide has a table showing that teachers complete instructional materials in 123.6 periods or 63.1 blocks.
- Materials are designed with additional days for teachers to use, including 10–20 Virtual Labs, Chapter Investigations, and Performance Tasks. In total, the materials include 256 days of instructional materials.
- Each unit overview in the materials contains Additional Resources at the end, which provide flexibility for extending lessons. For example, the Unit 2 Overview contains Additional Resources in the form of videos and articles that teachers can reference to extend a lesson.

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Indicator 9.1

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

1	Materials include an appropriate amount of white space and a design that supports and does not distract from student learning.	Yes
2	Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting.	Yes
3	Materials include digital components that are free of technical errors.	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 an appropriate amount of white space and a design that supports and does not distract from student learning. Each chapter subsection has a clear and prominent title. For example, Chapter 5.1 has the title Elements and Compounds, which is prominent and clear across the top of page 122 of the student-edition text. Additionally, chapter subheadings have text that is appropriately sized, colored, and organized. Students read the subsection The Parts of an Atom to gain prior knowledge before the next subsection, Bonds Between Atoms. All chapter content-related text is appropriately sized, with vocabulary words like element and references to diagrams and images like Figure 5-1 bolded for emphasis. Students have access to tools, such as a highlighter and a notepad, that they can use to annotate text while reading digital text. Students can also access text-to-speech supports highlighting each word as it is read. Images and diagrams are appropriately sized for students to see details and gather understanding without zooming in or out. For example, Figure 5-3 from page 122 of the Student Edition text has an image of “an atom . . . with protons and neutrons in a central nucleus,” which shows an accurate representation of an atom’s nucleus, with a zoom bubble to show what the protons and neutrons look like up close.
- Teacher guidance materials are appropriately designed with clear, designated places for important information. The chapter planners are laid out in a way that does not distract and enables teachers to locate important information for planning and implementation. For example, the Chapter 15 planner presents a table with three columns. The first column is titled Contents, the second column is titled Instructional Supports for All Learners, and the third column lists Digital Resources. The Engage section under Contents lists the case study Don’t Let

the Bedbugs Bite. In addition, the Instructional Support for All Learners section provides four different supports: Social-Emotional Learning / Cause and Effect - Natural Science and Genetic Diversity / Historical Connection - How Old Are Bedbugs / and English Language Learners - Shared Reading, while the Digital Resources presents Video 15-1 and Acquire English worksheet 15A.

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, students study the phenomena of sea pigs in the Chapter 1 Unit Phenomena Virtual Investigation located in the student materials and complete a virtual investigation of deep-sea ecosystems. Pictures appropriately portray the deep-sea, laboratory, and organisms for the investigation. Students select icons to further investigate the content, which includes types of organisms.
    - For example, after introducing the term microevolution to students in Chapter 14, materials present graphs illustrating the changes in the population in Finland of tawny owls. Students can see graphical evidence of the increase in brown-feathered owls: “However, as the climate warms, milder winters produce less snow in Finland. As a result, brown-feathered owls are becoming more common in the population.” In addition, the photographs of the owls with the dominant and recessive traits give the student real-world examples of microevolution that they can see and better understand.
    - For example, Section 6.1, Cell Structures, contains an age-appropriate image, called Figure 6-2, that shows the cell membrane, cytoplasm, and DNA in a bacterial cell (a), animal cell (b), and plant cell (c). Figure 6-2 includes labels for the cell membrane, cytoplasm, and DNA of each of the three cells show, as well as an appropriately sized caption that references content-related text to describe how the bacterial cell (a) is a model of a prokaryotic cell, and the plant (b) and animal (c) cells are models of eukaryotic cells.

Materials include digital components that are free of technical errors.

Materials include some digital components that are free of technical errors. The Chapter 1 Lecture Presentation items contain no grammatical errors, inaccurate content materials, and no wrong answer sheets. For example, the Unit 1 performance tasks within the Chapter 1 Lecture Presentation asks students to draw connections between characteristics of organisms and offer correct sample answers, free from errors. In addition, the text for Chapter 6, Cell Structures and Function in the student materials, includes content-related text, such as “all cells share certain organizational and functional features such as a cell membrane, cytoplasm, and DNA,” that is free of spelling, grammatical, or punctuation errors. Chapter 6 includes content-related text that is all accurate, such as “the DNA of a eukaryotic cell is contained in a nucleus.” However, Chapter 14 planner includes digital components that are not free of technical errors. For example, Investigation A - What Lived Here is the title of Investigation A in Chapter 14 planner in the teacher’s edition. The Lab Manual lists the title of

Investigation B as What Lived Here. The Chapter 14 planner has the title for Investigation A and B reversed.

Cengage Learning National Geographic
Biology, Texas Edition

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.

- 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, in Section 2.1, text located in Unit 1 of the student materials of *HS Biology TX Edition*, materials provide text-to-speech and either grade-level text or modified text. Embedded support includes student access to larger pictures and captions. The materials provide highlighting functions, notes, bookmarks, and full-screen capability. The materials provide these functions for students within the materials pages for students. Students select text to highlight (drop-down highlight options) and use the left and top panels to access additional functions.
- In addition, digital technology and tools enhance student learning through such features as learning games, interactives, simulations, and online assessments.
    - For example, the Section 2.1 Review section includes interactives, such as a drag-and-drop table. Certain words within the text provided embedded support for definitions, such as autotrophs and chemosynthesis in the Section 2.2 Review section located in Unit 1 of the Student Materials of *HS Biology TX Edition*. The Interactive Figure 2-8 allows students to remove organisms from the food web, see how the dynamics change, and make observations.

- For example, Unit 2 Virtual Investigation: Bacteria in the Digestive System, located in Unit 2 of the student materials of *HS Biology TX Edition*, enhances student learning through an interactive experiment with some of the microorganisms that are common to both human and baboon gut microbiomes. In this virtual investigation, student learning is supported and engaged as students freely progress through the Explore section at their own pace and in the order that they choose to study the gut microbiome of both humans and baboons. Additionally, the virtual investigations have tools that allow students to take notes on their digital experiment in the Notebook and Report tab.
- For example, the Looking at the Data activity titled 'Identifying Gene Mutations in Cancer Cells, located in Chapter 7 of the Student Materials of *HS Biology TX Edition,* enhances student learning in an online interactive that helps students interpret the results of the DNA microarray to identify how genes are expressed in normal and cancer cells. Additionally, tools, like a highlighter, are available for students to select and highlight text at choice. Accessibility features are available in a sidebar (i.e., Menu) on the right-hand side of the screen that allow students to change to background/text color, text size, or zoom of the screen. Under the Accessibility button on the menu, students can access a calculator, notepad, and sticky notes to help support student learning and engagement.

- Materials provide teacher guidance for using simulations, interactives, and related activities to support student learning. For example, in Section 15.1 in the teacher's edition, materials provide Video 15-1 to enhance student learning by showing a brief overview of bedbugs. The materials guide the teacher at 2:10 minutes to Use Video 15-1 to show a brief overview of bedbugs. Share with students that bedbugs are insects that feed on a host (a parasite). Have students discuss the mechanisms that allow a bedbug to feed on its host without waking the host.

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

- Materials provide opportunities for students to obtain, evaluate, and communicate information using digital tools.
  - For example, the Virtual Investigation: Sea Pigs on the Abyssal Plains in the Student Materials in Unit 1 provides students with a video, multi-step photos, objectives, and interactive pictures. The objectives include using a lab notebook, gathering data on the ocean floor, collecting samples, and writing a report using digital tools. The Chapter 1 opener outlines the virtual investigation as students will learn about the abyssal plain ecosystem and gather evidence, explore and learn, collect data, and analyze and report their qualitative and quantitative data to support their analyses.
  - For example, the Chapter 7 Tying It All Together activity titled Immortal Cells: The Story of Henrietta Lacks, integrates digital technology by requiring students to research the biology of HeLa cells and examine several ethical issues related to their use. Course-related content on cell growth and division is related to the science and engineering practices (SEPs) as students gather evidence and make a digital presentation to communicate their findings.
- Materials provide interactive simulations and models for students to explore scientific and engineering practices in a virtual environment.

- For example, the Unit 1 Media Library in the teacher materials: of *HS Biology TX Edition* overviews the digital technology for student interaction. Examples include STEM careers (Unit Video 2), using data (Video 2-3), interactive figures, and a population simulation in Chapter 4. In the Chapter 4 simulation, the materials prompt students to "Use the simulation to examine how rate changes affect the growth of a population."
- For example, the virtual investigation titled "Hummingbirds on the Move" in Chapter 15 states, "Students will grab their virtual binoculars and head into the field to gather evidence about hummingbird adaptations: After learning about hummingbird evolution in South and North America, students will explore how hummingbirds interact with their habitats near the Southwest Research Station in Arizona. Encourage students to make connections between their observations and the idea of fitness."

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 Unit 5 MiniLab: Polar vs. Nonpolar Molecules requires students to determine if a substance is polar or nonpolar and record their results and analysis on the student digital course platform. In this activity, the teacher can allow students to work collaboratively in groups or pairs, which the teacher can intuitively base on class size and individual student needs. As student groups/pairs complete Chapter 5 Minilab, they can discuss their results and analysis questions before individually posting answers to the student digital course platform.
  - For example, the Unit 2 Virtual Investigation: Bacteria in the Digestive System provides an opportunity for students to collaboratively engage in an interactive experiment and exploration to investigate what bacteria do in your intestines. This virtual investigation allows teachers to group students as necessary based on individual student needs.
  - For example, in the Connect to Language Arts activity titled Use Digital Media, located in Section 10.1 in the Explore/Explain section, students work in groups to select a topic covered in this section. Students research the topic of their choosing and determine how it compares between vertebrates and invertebrates. They then use evidence from the section and research to develop a digital media presentation to communicate their findings.

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

- Materials integrate digital technology that is compatible with a variety of learning management systems. For example, on the publisher's website titled Cengage Platform Help under the LMS Administrator Help sidebar, Cengage provides support for the following learning management systems: Canvas, Blackboard, Bright Space, Moodle, Sakai, Schoology, Shibboleth, and other LTI Advantage Compliance LMS.
- Digital materials are accessible and compatible with multiple operating systems and devices. For example, the publisher's website titled Cengage Platform Help under the LMS Administrator Help sidebar in System Requirements states, "Cengage web-based learning platforms require broadband internet access and supported web browsers and plugins." However, some activities and extensions can be downloaded as a PDF file that the teacher can save and access with or without internet access. This includes but is not limited to the assessment handbook. This site

further states, The Supported Browsers for different activity types may vary. If you are using SAM in MindTap, see SAM in MindTap System Requirements. The following list states what each browser requires:

  - Windows® - Chrome™ 106 and 107, Firefox® 106, and Edge 106 and 107
  - macOS™- Chrome 106 and 107, Firefox unsupported, and Safari® 14 and 15
  - Chrome OS™- Chrome 106 and 107
  - iOS - Safari 14 and 15 (iPad only)
- Under Cengage on iPad on the same site states that most Cengage features are available on iPad®, but some features require a desktop or laptop computer. The iPad limitations include Notifications and reminders do not display, video transcripts and closed captions do not display in full-size view, and you cannot print from the eBook reader.

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Indicator 9.3

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

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

Not Scored

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

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

Evidence includes but is not limited to:

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

- Digital technology and online components provide a rationale for the age-appropriateness of online components. For example, the front pages on the Student-Centered Learning in Biology by Catherine Quinlan page states, National Geographic Biology is designed to facilitate a more student-centered and cohesive way of learning. Additionally, the purposefully designed materials foster curiosity and engagement in the Case studies, Connections, Biotechnology Focus, and Tying It All Together. In the subsequent page, Exploration in Biology by Catherine Workman, the materials provide a rationale for the use of the Explorers at Work Video Series because they help illustrate key concepts for biology and touch on themes and ideas from several units. Additionally, these Explorers at Work Series videos will serve as a guide connecting the concepts in this program. They will appropriately give students a chance to hear firsthand from some of biology's most innovative and intrepid scientists.
- The digital technology and online components are aligned with the course scope and approach to science knowledge and skills progression.
    - The unit overviews include the Texas Essential Knowledge and Skills (TEKS) and science and engineering practices (SEPs) for online and digital components. The materials list TEKS by chapter and performance tasks. For example, the Unit 2 overview has an Assessment Planning section that contains a Performance Task table, shows the summary, TEKS connections, and timing guidance for planning the performance tasks

for Unit 2. The Assessment Planning section shows that the first performance task for Unit 2, "How Does Regenerative Medicine Reflect Nature," is developmentally appropriate for the Biology course and aligns with course goals by addressing TEKS 1.G, 3.B, 6.A, 6.B.

- A scope and sequence are provided in Scope and Sequence & Course Resources, which lists all TEKS covered throughout the school year and the order of progression. In addition, in the *Ancillary - HS Biology* Course Resources section, materials list all ELPS and SEPs taught throughout the year and their links in the student edition.
- The chapter planner provides TEKS and SEPs at the beginning of each chapter. For example, the Section 14.1 planner covers 14.1 Lines of Evidence (i.e., TEKS 3.C and 9.A and ELPS 1.C, 1.H, 2.C, and 2.E).

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

- The materials support teachers to successfully integrate the technology within the program. For example, the Support button located on the far right side of the teacher's edition takes you to the publisher's website and has a Getting Started TEACHER subsection that provides detailed guides and videos for NGLSync Resources and MindTap Getting Started - TEACHER to help assist teachers in getting started with your account and course creation in our NGLSync Platform. Additionally, the bottom of the Getting Started TEACHER subsection shows that teachers have access to a professional development training session to help dig into your MindTap online learning platform to help guide the teacher in using the embedded technology to support and enhance student learning.
- The materials provide specific teacher guidance for embedding the technology within lessons and assessments. Each chapter includes a chapter planner that outlines the resources and technology for each chapter. For example, the Chapter 3 planner in Unit 1 includes a column for Digital Resources and is organized by sections. The Chapter 3 overview includes Video 3-1 and Acquire English Worksheet 3A. The heading for Video 3-1 links to the video. The materials include which parts of the lesson to provide instruction regarding use of the materials. In the chapter planner, the materials guide teachers on when to use technology within the lesson. For example, in the case study, the materials guide teachers to "Use Video 3-1 to show the landscape in Yellowstone . . . before the 1988 wildfire" and "have students make a timeline of the fire." In addition, each unit and chapter includes a Media Library within the teacher materials. The Media Library includes chapter videos and interactive figures. For example, the Interactive Figure 3-8 outlines the activity: Scientists have identified 36 biodiversity hotspots, 14 of which are identified here. Select each biodiversity hotspot to learn about its unique characteristics. The materials provide guidance to have students research these hotspots to find out how they meet the criteria as a biodiversity hotspot and what other factors support species richness in these particular areas.

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 a Support button that is available to parents and caregivers to support student engagement with digital technology

and online components. For example, the Support button has a subsection called Getting Started-STUDENT that caregivers can use to support students in accessing and setting up the online components of their course. This Getting Started-STUDENT subsection contains guides and videos that caregivers can use to help students learn to navigate the online components. For example, the MindTap Interface Update Student Navigation Summer 2022 video contains guidance that caregivers can use to support students to learn about the user interface and navigation for their course. In addition, the Support button includes an Additional Support Resources section with a subsection called Student Guides, which contains a Panorama Student Guide document that caregivers can use to support student engagement with online components. The Panorama Student Guide provides step-by-step guidance, with visual screenshots, of all materials included in the Learning Panorama, including a Tour of the Home Page, a detailed look at the Assignments Page, instructions to help caregivers guide students with Navigating the Book Content. Furthermore, Using the Study Hub contains the informational video Using the Study Hub found in the Support button under MindTap Support. The video guides the user on how to interact with text and use the search tools. For example, the video states, “If I want to find a note . . . I can find it in the study hub.”