Myriad Sensors Conceptual Academy Chemistry

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Executive Summary

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

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

Section 2. Instructional Anchor

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

Section 3. Knowledge Coherence

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

Section 4. Productive Struggle

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

Section 5. Evidence-Based Reasoning and Communicating

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

Section 6. Progress Monitoring

- The materials include a variety of TEKS-aligned and developmentally appropriate assessment tools.
- The materials include some 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 some research-based instructional methods that appeal to a variety of learning interests and needs.
- The materials include guidance, scaffolds, supports, and extensions that maximize student learning potential.

Section 8. Implementation Supports

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

Section 9. Design Features

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

Section 10. Additional Information

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

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Indicator 2.1

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.

- Students are given opportunities to ask questions, come up with solutions to a problem, and make decisions based on scientific evidence in the "Contextual Chemistry" sections. For example, Chapter 7, "Contextual Chemistry," requires students to think critically about the information presented in the section, discuss it with classmates, form an opinion, and defend the opinion.
- The material allows students to apply scientific and engineering concepts by investigating phenomena, including the scientific and engineering process. For example, in the "Salt to Ice" experiment, students perform an experiment, collect data, construct a model, communicate their results, and refine their results. In another example, the Rubber Band Balance investigation, students create a balance out of the materials provided, calculate data, and form a conclusion.

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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.

- Strategic implementation of TEKS is found within the third column of the Lesson and Activity Pacing Guide. The materials address appropriate concepts and grade-level knowledge as outlined in the TEKS. For example, Chapter 4.8 is presented in a strategic and systematic way. The sample chapter included in the materials provides students with many video and reading checks embedded in each section. Each chapter includes a "Concept Check" at the end to allow students to check their mastery.
- The chapters in the material also follow an order that allows students to build on prior knowledge. For example, "Particles of Matter" precedes "Elements," followed by "Subatomic Particles," then "Atomic Nucleus," and finally, "How Atoms Bond." The sequence facilitates the correct order of learning while following the TEKS guideline for the Chemistry course.

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

- Materials include sufficient opportunities, as outlined in the TEKS, for students to ask questions and plan and conduct classroom, laboratory, or field investigations. For example, engineering design skills are included in activities such as Chapter 6, "Marker Out of Your Shirt," Chapter 9, "Thermal Energy and Chemical Reactions," Chapter 12, "Steam Distillation," and Chapter 15, "Cleaning Water with Dirt."
- The materials provide students with opportunities to ask questions and investigate phenomena. For example, in Section 6.8, students perform a hands-on activity to discover how to remove marker stains from a shirt. The students make predictions, conduct an investigation, and then develop conclusions about the role of intermolecular forces in removing stains. The Chapter 2 activity, "But is it Gold," provides students with an opportunity to plan their investigation.
- In Lesson 7.2, students investigate the sweetness of aspartame using serial dilutions. The end of this experiment includes multiple opportunities to plan further related investigations. Students are also encouraged to ask questions and plan investigations in their Field Journal.

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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 include multiple embedded phenomena and engineering activities across lessons that guide student learning. For example, "Chapter 7.2: Solutions" includes an activity for students to make predictions and observations relating to the phenomena of solubility and water displacement. The students document their findings in their field journals.
- For example, the "Pocket Lab Resources" asks students to explore the phenomena of parallax and then asks students to design and build a telescope using engineering principles.
- The materials provide students with opportunities to demonstrate authentic application and problem-solving through hands-on lab work. For example, in "Lesson 4.3: Discovering the Atomic Nucleus," students simulate Rutherford's Gold-Foil experiment and make predictions, observations, and conclusions throughout the lab. In "Lesson 7.7, Purifying Drinking Water," students use their knowledge of the properties of water to investigate the process of wastewater treatment.
- Phenomena and problems are embedded across the materials. For example, in "Section 7.4: Solubility," students perform an investigation to isolate white sugar from brown sugar. Students use scientific processes to collect and analyze data and draw conclusions. The conclusion of the

activity asks students, “What similar activity could be done next to further study this concept?” This prompt encourages students to think like scientists.

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

- Materials include phenomena embedded throughout the chapter sections. Each phenomena activity requires students to make their own observations and answer questions before they investigate. The topics directly relate to common ideas and concepts that the students are familiar with. For example, Lesson 9.4 relates the phenomena of different endothermic and exothermic reactions to the concepts of magnetism. Chapter 3.2, “Elements are Made of Atoms,” discusses the “Blue-Green Penny.” This phenomenon connects with students’ prior knowledge and is used again in the Review.
- The material activates students' prior knowledge at the beginning of lessons and associates relatable information with the students. For example, when first introducing the concept of the atom in Chapter 4.1, the material references multiple metaphors incorporates ideas from microorganisms in biology, and relates the information to weather patterns. These references bridge new information to information already familiar to students.
- Each chapter has an overview section for teachers to review the prior knowledge that is needed before starting the chapter. Each chapter also has many reading and concept checks throughout before prompting students to move forward. For example, the Overview from Chapter 7 recaps students' scientific knowledge from Chapter 6 and previous chapters before asking probing questions.
- For example, the “How Sweet is Sweet” activity in Section 7.2 recalls students' prior knowledge of laboratory procedures. They are then asked to formulate a conclusion based on their experience with the activity. In a hands-on investigation from Section 9.2, “Cookie Chemistry,” students “evaluate scientific explanation using observational testing.”

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

- There is an online tutorial link for teachers that allows them to create and assign lessons for the pocket lab activities. These links define the scientific concepts and goals which align with phenomena and engineering problems throughout the material. Each phenomenon has a teacher's corner to guide teachers through the explanations. The materials include a list of goals and concepts for each activity. The activities also include an answer key to help explain the phenomena to students. For example, the lab “Bubbly Rocks,” in Chapter 10.5, states the purpose of the lab: "To use a weak acid to break down rocks or shells and find out how much of them is composed of carbonate.”
- The Teaching Tips section includes goals designated by bullet points and includes possible student misconceptions. This section specifically outlines teaching tips for each section of the chapter. Each lesson also includes an “About this Lesson” section that lists the learning goals for the lesson. For example, the Lesson “Investigating Heat Islands” lists three learning goals: “Students should be able to: 1) Explain what a heat island is and what causes them, 2) Explain what effects heat islands can have on the local and global scale and 3) Propose effective measures that can alleviate or eliminate heat islands.”

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Indicator 3.1

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

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

Meets | Score 6/6

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

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

Evidence includes but is not limited to:

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

- Materials are designed for students to build and connect their knowledge and skills within units. For example, in Section 2.3, Mass and Volume, students learn the definition of mass and volume as they work with different objects. Then in Section 2.4, Density is a Ratio, students use what they learned in Section 2.3 to calculate density, which is mass divided by volume. In another example, Chapter 3, Elements of Chemistry, introduces the concept of matter first, including physical and chemical changes. Students then learn that all matter is made up of atoms in Section 3.2, followed by how atoms are classified in the Periodic Table in Section 3.3.
- Materials are designed for students to build and connect their knowledge and skills across units. For example, students learn what a mixture is, and work with examples of mixtures in Section 3.6, Most Materials are Mixtures. Then, in Section 7.2, Solutions, students learn to define solutions as a type of mixture. In another example, in Chapter 2, students learn about particles of matter. Then, in Chapter 3, they build on this knowledge to include the elements that make up all matter. In Chapter 4, students progress to subatomic particles, followed by Chapter 5, which focuses on the nucleus of atoms.
- One of the most powerful tools for students throughout these materials is the inclusion of a “Field Journal” that is referenced in each unit. Using their journals, students practice skills and ideas of phenomena that connect across units.

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

- The material scaffolds learning for students to gradually deepen the complexity of concepts over time. For example, in Section 6.2, Ion Formation, students learn how and why atoms form ions. Then in Section 6.3, Ionic Bonds, students deepen their knowledge to include how ions and their charges affect bonds within compounds.
- The materials are also designed to deepen student understanding through videos and podcasts in various sections. For example, Chapter 3 includes a "Big Picture Podcast" and Section 3.1 contains supplemental videos and video checks. In Section 10.1, Exchanging Protons, videos introduce the differences between acids and bases before students are checked for their understanding.
- Section 11.1, "Losing and Gaining Electrons, provides opportunities for students to define concepts, read for understanding, view diagrams, and complete a reading and concept check. A "Practice Page" requires students to show relationships and answer comprehension questions. The section culminates in a "Phenomenon" where students perform a hands-on activity and then observe, analyze, and draw conclusions.
- Section 11.8, Corrosion and Combustion, begins with videos and textual information that includes embedded diagrams, figures, concept checks, and a real-world connection between a campfire and our breath. This introduction is followed by a hands-on investigation into silver tarnishing that includes entries in a science journal. The second "Phenomenon" included in this section includes a teacher's section with answers to students' questions and guiding students to make connections.

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

- Materials clearly and accurately present course-specific core concepts. For example, the materials include a "Thumbnail" that outlines the units on one page. These units correspond to the main topics in a first-year chemistry course. The units each contain section outlines that proceed logically through the course. For example, students learn to define compounds in Section 3.4, followed by Section 3.5, System for Naming Compounds.
- The material clearly outlines the core concepts presented in each chapter. For example, each chapter includes an "Overview" that describes the main idea in detail and summarizes what students should take away from the chapter. The chapters also include "Teacher Tips" sections that outline the core concepts for teachers, how these concepts correlate to the course as a whole, and the learning objectives for the students.
- Science and engineering practices are clearly presented in the pocket lab notebook section of the materials as well as in the students' "Field Journal." For example, in the "Investigating Heat Islands" activity, students make predictions and collect data using temperature probes. This information is recorded in their "Field Journal," and students then draw conclusions. There is a field journal exercise at the end of each unit.
- The "Contextual Chemistry" section included at the end of each chapter also provides students with opportunities to collaborate and discuss potential answers to scientific problems. Throughout the materials, hands-on activities and opportunities to ask questions and plan investigations are included, but not often. For example, Section 11.8, Corrosion and Combustion, includes many science and engineering design processes, but students do not engage in planning, carrying out, revising, or improving them.

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

- Summary review questions are found within each chapter. These review questions cover the concepts presented in the lesson. For example, in Section 10.1, Exchanging Protons, the material covers how acids and bases are named using IUPAC nomenclature. The end of the lesson contains ten mastery questions requiring students to name acids and bases in a variety of ways.
- For example, Chapter 3 includes worksheets, summaries, and video checks embedded within the unit to assess mastery of main concepts. Sample Unit 3 also includes a test bank so teachers can design their own assessments for mastery.
- Hands-on lab activities are also structured for students to show mastery of the concepts. For example, students practice building 3-D molecular structures in the “Gumdrop Molecules” activity in Section 6.6, Molecular Shapes. Students complete models to show mastery of the concept of molecular structure that is within the bounds of the lesson.
- Section 9.1, How Chemicals React, includes text and video to introduce chemical reactions. Comprehension and concept checks are embedded in the section and made clearer through illustrations and diagrams. The section includes a numbered set of rules for balancing chemical equations and multiple sections for determining the type of reaction. Students acquire and demonstrate mastery through review questions and flashcards at the end of each section.

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Indicator 3.2

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

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

Meets | Score 6/6

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

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

Evidence includes but is not limited to:

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

- The materials include a Curriculum Map and Vertical Alignment Grid to support teachers in understanding the vertical alignment of the course. They also include a variation of vertical alignment within the scope of the course itself. Each chapter contains a "Teaching Tips" section that includes the prior knowledge that students should have from previous lessons.
- Teachers are guided in the development of scientific and engineering practices. For example, tutorial videos are provided on how to use the various pocket lab activities, such as "Pocket Lab Thermo - Getting Started," which instructs teachers on the various instruments used in the section. The materials also include practice pages, test banks, a sample letter to parents, teaching tips, class activities, a how-to-study guide, and podcasts for review.

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.

- Each chapter contains instructor resources that provide guidance and support to the teacher, such as the "Teacher Tips" that outline the learning objectives and possible misconceptions in the chapter, as well as teaching tips to support teachers in the delivery of the chapter content.

For example, Section 3.2, Elements are Made of Atoms, contains explanations and visual representations of physical properties and changes. It also includes a video, followed by a video check, to make sure students understand the concept before proceeding to the next one.

- The phenomena-based activities in the materials include a “Teacher's Corner” that explains common misconceptions students may face within an activity. For example, Section 2.4, Density is a Ratio, includes the activity “But is it Gold?” Within the section “Sources of Error (Teacher's Corner),” the materials explain a source of error students may face when measuring volume in a graduated cylinder. It discusses how volume must be measured at eye level and the reason why. In Section 9.6, Chemical Kinetics, the phenomenon activity “Trouble With Bubbles” includes a Teachers Corner that provides a detailed explanation of the phenomenon for teachers to share with students.
- A link in the Instructor Resources called “Chemistry Teaching Tips” contains “Possible Misconceptions to Correct” for each chapter. For example, Chapter 3, Elements of Chemistry, lists “compounds retain properties of the elements from which they are made” as a common student misconception.

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

- The materials explain the intended use of the instructional design of the program in the “About This Program” section. This section includes a navigation video that provides teachers with an explanation of the intent and purpose of the program. The video also explains the use of the field journal. Each unit contains multiple activities for teachers to choose from as time permits. Activities include practice pages, inquiry-based activities, student writings, presentation suggestions, hands-on activities, and simulations. Each chapter provides a draft letter to parents and caregivers outlining the purpose of the current topic.
- The About This Program section also states that the lessons are intended to be edited by the instructor. Teachers can edit the paragraphs, as well as add illustrations and videos. The teacher can also deliver the material in any order they see fit. The material makes teachers aware that they can “customize the resource” to their individual needs and their student's learning needs. Chapters include “Instructor Resources” such as a “Lesson and Activity Guide,” “Within This Section,” “About the Homework Practice Sessions,” and “Capstone Student Projects.”

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Indicator 4.1

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

1	Materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers.	M
2	Materials provide multiple opportunities for students to engage with course-level appropriate scientific texts to gather evidence and develop an understanding of concepts.	M
3	Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts.	M
4	Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.	M

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials provide opportunities for students to engage in productive struggle through sensemaking that involves reading, writing, thinking, and acting as scientists and engineers.

Materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. Materials provide multiple opportunities for students to engage with course-level appropriate scientific texts to gather evidence and develop an understanding of concepts. Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts. Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.

Evidence includes but is not limited to:

Materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers.

- The materials include multiple opportunities for students to do meaningful sensemaking. For example, in Section 5.2, Radioactivity is Natural, students first answer a probing "Curiosity Question" that allows them to input what they want to learn about the topic. Then throughout the activity, students have multiple opportunities to develop their own thoughts and apply what they learned to an actual scenario.
- Another way the materials support meaningful sensemaking is through the Contextual Chemistry sections in each chapter. These sections include Concept Checks and also the author's responses to "Think and Discuss" questions. For example, Chapter 2 presents a case for "Green Chemistry" and Chapter 3 includes a lesson on efforts to extend our human life span. For example, in Section 17.2, Galvanic Cells, students must engage in productive sense-making using information they have learned in the section to answer the question, "How is toast connected to a dinosaur?"

- The materials provide multiple opportunities for students to act like scientists. For example, in the “Developing a Model for Particle Motion” pocket lab activity, students begin the activity by answering a question and formulating a hypothesis. They must then record the response in their field journal. Students complete the investigation by watching a video and recording observations. Students then carry out the experiment (act like a scientist) and collect data. Students end the experiment by making a claim. In another example, the hands-on activity “Marker Out of Your Shirt” in Section 6.8 prompts students to keep a complete record of their performance of the activity. Students record procedures, data collections, observations, questions, graphs, and conclusions in their field journals just like a real scientist would. In another example of students acting like scientists, Section 17.1, Redox Chemistry, includes an activity with half of the students writing in support of fluorescent light bulbs while the other half writing in support of LED bulbs. When they have completed their writing, the students engage in respectful argumentation, modeling the scientific process.
- The materials provide opportunities for students to plan and revise like engineers. For example, the Water Filtration Challenge in Lesson 7.7, Purifying Drinking Water, includes all the features of an engineering design. The students brainstorm ideas, build and test a prototype, refine and revise as needed, and then present their results. Hands-on activities and labs in the materials include engineering practices such as: how could this be improved, what could we do next, and what would you do differently?

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 with the text and to develop an understanding of concepts. For example, Chapter 1 provides eight sections for students to build knowledge as they progress through the text and includes videos and video checks as well as reading passages with reading checks for each section. Students are encouraged to gather evidence relating to the various scientific concepts in each section. Chapters also include “Chemical Connections,” such as Section 1.4, which asks students to make a connection on how their fingernail is connected to the air. Another example of how the materials provide multiple reading, video, and concept checks within each lesson can be seen in Section 11.3, Electricity from Batteries. In this lesson, students watch videos, learn about batteries through text and diagrams, and complete a Reading Check that requires them to summarize the main takeaway. Finally, an example of the rich and varied sources used to support student learning and conceptual understanding in these materials can be found in Chapter 17, Capturing Energy. Each section in this chapter begins with a textual explanation of the content and is also accompanied by a video component. Each section also includes podcasts, diagrams, and graphs with explanations, links to sources to extend learning, and “For Your Information” sections.
- The material also incorporates multiple phenomena-based activities that allow students to develop an understanding through independent thought processes. For example, Section 3.1, Physical and Chemical Properties, includes a “Fire-Extinguishing Gas” activity. This activity requires students to engage with the material in multiple ways, including reading through the material, completing an investigation of the phenomena, analyzing the results, making conclusions, and recording their thoughts in their field journals. Other examples of how the materials use phenomena-based activities to develop student understanding include Section 3.1, Physical and Chemical Properties, which uses a hands-on activity to help students to distinguish between chemical and physical changes, and Lesson 4.3, Discovering the Atomic Nucleus, another hands-on activity in which students model Rutherford's Gold Foil Experiment.

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

- The materials provide multiple opportunities for students to engage in various written and graphic modes of communication. For example, Section 3.1, Physical and Chemical Changes, includes eight figures embedded within the section to help students visualize the concepts, four videos with video checks, a reading check, and a concept check. The pocket lab activities for Section 3.1 includes activities such as video observations, diagramming phenomena, and collecting and recording data in both charts and tables.
- Students also have multiple methods to record their thoughts and demonstrate mastery of the material. For example, throughout every chapter in the "Phenomena" and "Hands-On Activities" sections, students record observations, data, graphs, and conclusions in their own field journals. Students are given a choice in the "Adopt an Element" activity in Section 4.6. Once they have researched their chosen element, they create a presentation and write a report to share with the class.
- In another example of the multiple ways students engage in written and graphic modes of communication, Lesson 4.2, Discovering the Electron, has students documenting their curiosity questions for the lesson, writing their knowledge of the lesson in free-flow format, writing a letter to a famous scientist, and even creating a limerick. Further, students make their own chapter map (graphic organizer) in Section 17.3, The Nuclear Industry. Students create a data table in Section 17.5 and then are given a choice to prepare an outline for a presentation or to write an article.

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.

- The material includes multiple opportunities for students to act like scientists and engage with phenomena. For example, in Lesson 9.4, Exothermic or Endothermic?, students make predictions, collect temperature data from solutions, compare their data to sample data, record curiosity questions, get together with a classmate to discuss and explain, and then build connections between what they've just learned about instant cold packs. In another example, students act like scientists in Section 2.5, Developing a Model for Particle Motion. In this activity, students watch phenomena on video, complete a video check, formulate a hypothesis, and perform an experiment to test the hypothesis. Finally, students discuss their evidence and use their reasoning to formulate a conclusion just as scientists would.
- The materials include many opportunities for students to act like engineers and use engineering design processes. For example, the Photovoltaic Pocket Lab experiment addresses the oxidation and reduction of TEKS. The materials ask students to "evaluate the engineering design of various photovoltaic cells. For a proper evaluation, you should first be able to explain the workings of a basic photovoltaic design." The materials also ask, "What questions do you have?" Students must talk, evaluate, and compare. Another hands-on activity, "Not a Shocking Experience," has students building a working battery with pennies, cardboard, vinegar, and aluminum foil. They must assess and analyze the data to draw conclusions and then summarize their results. This lab is an example of using engineering processes to analyze, revise, and try again. The materials include a Steam Distillation Pocket Lab where students can extract cinnamaldehyde from ground cinnamon. Students can extend the activity to other distillations or compete against each other to see who can distill the most cinnamaldehyde.

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Indicator 5.1

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

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

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials promote students' use of evidence to develop, evaluate and communicate 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 include opportunities for argumentation and discourse 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 of 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.

- In Section 1.1, students work through a practice page called "Making Hypotheses," which prompts students to think and write about the best ways to obtain evidence to support a hypothesis. In another example, students hypothesize about telescopes in Section 4.5, Spectral Lights. The activity requires students to use the information they gathered from the lesson to construct their responses.
- The materials include many hands-on activities that prompt students to conduct an experiment, collect and analyze data, and write conclusions based on their hypothesis. For example, the hands-on activity "Molecular Polarity" in Section 6.8 prompts students to mark up a shirt, explore the solubility of markers they used, and use evidence to support their conclusions. In another hands-on lab in Section 11.6, Electrolysis Produces Change, students split water using electrolysis, observe the amount of gas that is produced, and use evidence to support their conclusions.
- The materials also include pocket labs that require students to make a claim and then support it with evidence. For example, the "Vaccine Storage Design Challenge" Pocket Lab requires

students to develop a storage model using different materials, some insulators and some not. Students then need to collect data to prove or disprove their hypothesis.

- When experiments are concluded, the materials take students further to analyze their results using claims and evidence. Students must answer questions like: “What events in the experiment were expected? What events in the experiment were unexpected? What types of errors could have occurred in the experiment?” and “How could this activity apply to chemistry in the everyday world?”

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

- Students must summarize their findings in their Field Journal at the conclusion of lab activities. This activity requires them to incorporate the scientific vocabulary they learned from the previous lesson in order to write the summary successfully. For example, Section 9.4 prompts students to explore the heat given off by a burning candle. Students practice using their new vocabulary as they document their observations and conclusions regarding endothermic and exothermic reactions in their Field Journal.
- As new vocabulary is introduced, it is highlighted, followed by higher-level questions requiring students to utilize vocabulary in context, as is seen in Section 2.3, Mass and Volume. The materials frequently integrate new vocabulary with formulas or equations, as seen in Section 2.4, Density is a Ratio. Most chapters include writing activities, such as Section 8.4, Liquid and Gaseous Phases, for example. Students choose a writing prompt and then describe various scientific scenarios using the knowledge and vocabulary they learned in the lesson.

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

- The materials support student argumentation and discourse. For example, as students complete the “Heat Islands” Pocket Lab activity, they are prompted to make predictions and investigate the phenomena. The activity includes a class discussion over what they think the potential effects of heat islands are. In Chapter 9, Contextual Chemistry: Mercury Emissions, students consider voting for or against mercury regulations. Students then read the author's argument for or against the regulation.
- Discourse is supported in the many “Next Time Question” sections that prompt students to discuss a question with their peers and come to a conclusion. The correct answer is given the next time the class meets. For example, in Section 1.4, The Natural World, students are asked to choose which of three statements is an actual scientific claim for “next time.”
- Student discourse and argumentation are somewhat supported in the materials. For example, The Phosophogypsum Dilemma draws students’ attention to the chemistry involved in manufacturing plant fertilizers. While we need these fertilizers to produce plants to feed our rising population, the waste product includes heavy metals that can contaminate groundwater. This article should spark a lively debate among environmentally aware students. Another example of respectful debate in the chemistry materials is a pocket lab that covers agricultural desalinization, water rights, and the ongoing Colorado River debate. Lastly, The “Fragrant Balloon Phenomenon” provides an opportunity for student discourse grounded in content knowledge to answer the question, “How did the fragrance leave the balloon?”

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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.

- Students justify their explanations of phenomena in Section 2.4, But Is it Gold?, when students conduct an experiment in groups to explore whether a balloon will sink or float and conclude with a group discussion. Another example in which students justify their explanations is found in the pocket lab activity “Investigating Heat Islands,” in which students are asked to complete group questions while they perform their investigations. Students also construct written explanations of phenomena in Section 7.6, “Softening Hard Water.” In this activity, students collect evidence from the lesson to support their argument regarding hard or soft water. The activity does not include students presenting their work or arguing opposite viewpoints.
- Phenomena activities allow students to record claims based on the information presented in the previous lesson. For example, Section 9.4, Exothermic or Endothermic, includes the phenomenon of Warming and Cooling Mixtures. Students document observations and make claims backed by evidence from their observations, which they record in their Field Journals.
- Students must construct an argument based on their observations in Section 7.2, Solutions: Filled to the Brim, to explain how solids take up space even when dissolved. Students must also construct a verbal or written argument to justify their explanation in Chapter 2, Fragrant Balloon Phenomenon. Similarly, they must construct and present an argument to explain the “Perplexing Displacement” phenomena in Section 2.3.

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Indicator 5.2

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

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

Meets | Score 4/4

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

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

Evidence includes but is not limited to:

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

- The materials provide teacher guidance for student misconceptions and possible responses. For example, Chapter 5, Teacher Tips, contains a list of student misconceptions that teachers may encounter in the chapter and how the teacher can address them. Also, the Instructor Resources section contains answers to chapter review questions and includes student misconceptions with suggestions.
- The materials frequently include "deeper thinking" questions within the hands-on activities' Data Analysis and Conclusion sections. For example, Section 9.2, Cookie Chemistry, includes several questions in both the data analysis and conclusion sections to initiate student thinking. As students work through the activity, there is teacher guidance to help students deepen their thinking of everyday phenomena.
- The materials include "Next-Time Questions" that the teacher can implement at the end of a class and then address at the beginning of the next class. This section specifically supports teachers in using questioning to deepen student thinking. The materials also include "Ask Your Neighbor" sections that contain questions the teacher can use to deepen students' thinking. "Are atoms made of molecules or are molecules made of atoms?" is an example of an "Ask Your Neighbor" question from Chapter 6.
- There are also many practice questions embedded in the materials. For example, Chapter 3 contains 26 review questions with answers and guidance for the teacher to use to support and

grow the students thinking. A pocket lab activity called “Developing a Model of Particle Motion” helps students deepen their thinking of everyday phenomena. In another example, Section 3.4, Humid Flames, includes several questions to initiate student thinking.

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

- The materials include many guided activities within sections that teachers can use to develop student knowledge and use scientific vocabulary. For example, Section 1.4, The Natural World, contains a lesson with conceptual vocabulary questions. The section concludes with multiple extension activities that the teacher should implement to encourage students to apply the new vocabulary.
- The materials provide vocabulary scaffolding within lessons. For example, Chapter 3 includes vocabulary words in bold terms with definitions in context. Content vocabulary is used in meaningful and increasingly complex ways to scaffold student learning throughout the chapter and activities. The chapter culminates in a writing activity, “Mixture Terms,” that requires students to use their newly learned content vocabulary in a writing activity.
- The Handbook of Class Activities: Verbal section contains multiple guided lessons to help students use their scientific vocabulary in different scenarios. The materials support vocabulary development, as exemplified in Chapter 3 Review, which includes key terms, flashcards, and short review questions to assist with vocabulary. The pocket lab activities also provide teacher guidance to scaffold and support scientific vocabulary development.

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

- The materials provide teachers with guidance on how to help students write hypotheses for phenomena and hands-on activities. For example, the Sensor Activity found in Section 2.8, Gas Laws, provides teachers with multiple guiding questions and directions to give to students to lead them to construct a hypothesis regarding pressure and volume. In the pocket lab activity “Developing a Model for Particle Motion,” students make observations, experiment and test phenomena, and construct verbal claims in their group. Students then construct written claims on the phenomena.
- The materials actively guide teachers through student discourse and the use of evidence to support both written and verbal claims. For example, in the “Coin Flip” activity, students observe and record data and then write a short paragraph. Students then present their arguments to the class. The instructions say, “Be prepared to back up your argument respectfully, with empirical evidence. Be prepared to make evidence-based predictions.” Another activity that involves using evidence to construct claims is Section 9.5, Entropy, which encourages students to take pictures, gather data to analyze, and make conclusions based on evidence from the experiment.
- Students are also prepared for discourse after chapter videos. Students are prompted to fill out a table with written information from the video and then work in a group setting to discuss the topic. For example, in Chapter 3, students view a podcast and then are prompted to answer a video quiz and review questions as a group. In another example, a historical activity requires students to choose a historical figure to research, create a Venn diagram, and present their findings to the class. Throughout the activity, the materials provide teacher support for guiding the student discourse and how to use their evidence to support claims.

- An example of teacher guidance to prepare students for discourse can be found in Section 15.6, Writing: Agricultural Practices. Students begin with an independent writing assignment, followed by group presentations on water rights. The activity culminates with a water rights debate over the Colorado River classroom presentation. The “Any Questions” activity on page 16 of the “Handbook of Class Activities” is a verbal activity that requires classroom discussion. The materials provide proper teacher guidance on how to facilitate student discussions and also how to help students prepare their responses for this activity.

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

- In Chapter 5, students read and research about nuclear fission. The Presentation Activity tells students to “prepare a class presentation on modern fission reactors... and....highlight the potential impact of this current research on society as well as the methods of science themselves. Conclude by expressing your opinions on the promises and dangers of nuclear energy.” In another example of students finding solutions, Section 16.6, How We Pollute Air, encourages students to use engineering solutions to prevent the theft of catalytic converters.
- The material contains multiple "Next Time Questions" that provide guidance and support for the teacher to promote student discourse. For example, Section 9.2, "Measuring Molecules," contains a "Next Time Question" over carbon atoms. The material encourages the teacher to prompt students to share ideas and how to implement the question.
- The materials also support the teacher to help students discuss their thoughts with one another. For example, the “Please Describe” activity in the “Handbook of Class Activities” facilitates student discussions over different lesson questions facilitated by the teacher. In the pocket lab activity, “Developing a Model of Particle Motion,” students work in groups to discuss various parts of the activity. Students are then asked to perform the experiment to find solutions and finally asked by the teacher to extend their thinking to explain, “What scientific concepts or principles can help explain the evidence and support your claim?”
- The materials include many instances of lessons that include student discourse. For example, after chapter videos, students are prompted to fill out a table with written information and then work in a group setting to discuss video topics. The materials also contain multiple “Next Time Questions” that provide guidance and support for the teacher to promote student discourse. Finally, Section 17.2, Fossil Fuels, encourages students to complete an independent Building Connection research and then share their thoughts on the dangers of methane hydrates with the class.

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Indicator 6.1

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

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

Meets | Score 2/2

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 diagnostic assessments that provide teachers with information to monitor progress and identify learning gains in a variety of formats. For example, the “Assessment Guide” lists formal and informal assessments for each unit and diagnostic, formative, and summative assessments.
- In addition, Chapter 1, “Instructor Resources Conceptual Chemistry Test Bank,” provides formal class assessments.
- Finally, Section 2.4, Density is a Ratio, includes a variety of formats to monitor progress and identify learning, such as informational text with embedded questions, hands-on activity with questions, a phenomenon with an activity and writing prompts, and a simulation using technology.
- Materials include formative assessments in a variety of formats to measure student learning and determine the next steps for instruction. For example, Section 7.3, Concentration and the Mole, includes the PhET simulation “Concentration.” The simulation contains multiple guided formative assessment activities that allow students to demonstrate their knowledge of concentration.
- In addition, Section 9.1, How Chemicals React,” contains concept checks embedded within the lesson. It also contains a PhET simulation and two practice page worksheets for students to demonstrate their understanding of balancing chemical reactions.

- Practice Page worksheets included in most sections provide diagnostic and formative assessments. For example, Section 10.1, Exchanging Protons, includes a Practice Page worksheet called “Brønsted-Lowry—Exchanging Protons.” In this practice, students first read about the process of hydrogen ion transfer from one molecule to another. They are given a graphical sheet to draw and mark up to reinforce the process. Finally, students solve acid-base problems pictorially with arrows and circles. The sheet can be printed and turned in for a “check for understanding” or submitted digitally.
- Materials include opportunities for teachers to collect information about what students are learning from the materials and use it to plan future lessons. For example, Chapter 1, Instructor Resources Conceptual Chemistry Test Bank, provides formal class assessments.
- Materials include summative assessments in a variety of formats, such as PocketLab Notebook activities, video assessments, and practice exercises. All of these use various formats such as written expression, multiple choice, and fill-in-the-blank. For example, the Review at the end of Chapter 2, Particles of Matter, requires students to think at various levels to complete a formal summative assessment largely comprised of short answer questions.
- In addition, Chapter 9, Chemical Reactions, contains a list of review and homework questions throughout the entire chapter. Teachers can embed these questions into quizzes and tests. Review questions in Chapter 9 include “What is the purpose of coefficients in a chemical equation?” and “Why don’t all collisions between reactant molecules lead to product formation?” The Homework Practice Session in Chapter 9 is a test bank of 127 questions, including both short-answer and multiple-choice questions. Students play it in a digital game format to an accomplishment level that the teacher can assign.
- Materials include a variety of informal assessments that give teachers feedback on student learning at the moment so that they can modify instructional approaches. For example, the “About this Program Handbook of Class Activities” provides informal class assessments and strategies for teachers to use, such as the “Cartooning” activity. In this activity, immediately after a lecture, students are instructed to draw a cartoon of the main point. Then they gather into teams to compare and contrast their cartoons and draw a final cartoon based on group input. Each group’s cartoon is then shared with the class. The teacher can use the results to address student misconceptions or gaps quickly.
- For example, in Section 1.3, “Minds-on Activity, Whacky www,” students must use the internet to research a topic such as “Brominated Vegetable Oil,” “Genetically Modified Organism,” “Glyphosate,” “Adderall,” “Hydroxychloroquine,” “Thimerosal,” or “Thalidomide.” Students summarize different articles they can find from three types of search engines: “Crawler, Human Powered, and Scholarly.” Then they compare and contrast the results. Finally, they summarize the usefulness of various types of search engines. The teacher can check the results to address any student misconceptions or gaps.

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

- The materials assess all student expectations for the course as outlined in the TEKS. The About This Program section of the materials contains a pacing guide that clearly indicates how the materials align with the curriculum for the subject and lists each expectation that is assessed within the materials. For example, the pacing guide shows that Section 2.8, Gas Laws, covers TEKS 10A, 10B, and 10 C. It also shows that the questions and activities of Section 2.8 assess all student expectations for those TEKS.

- Both the “Instructor Resources Conceptual Chemistry Test Bank” at the end of each chapter and questions within each section list the ELPS/TEKS alignment and levels of difficulty for each question.
- The materials include detailed TEKS-based lesson plans that outline how the materials can be used to teach specific concepts and skills and address specific students' expectations and guidance on how to assess student learning. For example, Section 2.6, Temperature and Heat, includes an outline of the lesson: 1) A video on Temperature followed by a video check, 2) A lesson on Temperature followed by a Concept Check, 3) Videos on Thermometers and the Celsius scale, followed by Video Checks, 4) a reading on Heat, followed by a Reading Check, and 5) A wrap-up Concept Check.
- The materials include TEKS-aligned assessments that align the curriculum standards and student expectations and are designed to measure student understanding and mastery of the concepts and skills taught in the materials. For example, each chapter contains hundreds of practice questions for students in the Homework Practice section. These questions are aligned with the specific TEKS of the chapter.
- The materials indicate the student expectations assessed in each activity and review assignment. Each unit of study contains various video and reading checks that assess the specific TEKS. For example, each chapter contains embedded homework questions. Each section of questions is aligned to specific TEKS listed for the section in the “Lesson and Activity Pacing Guide.” TEKS are also listed in the right margin.
- In addition, other examples include Section 2.7, Phases of Matter, which covers Chemistry TEKS 3A. The section contains a phenomena activity, “Phases of Water,” in which students evaluate a scientific explanation using evidence and logical reasoning, as stated in the 3A TEKS.
- Additionally, the “Instructor Resources” section of Chapter 8, How Water Behaves, concludes with a Review section. The Review questions assess TEKS 11A, “Describe the unique role of water in solutions in terms of polarity,” which is the TEKS listed for that section.

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

- The materials include assessments requiring students to integrate scientific knowledge and science and engineering practices appropriate to the student's assessment expectations. For example, each chapter and Pocket Lab Resource contains Hands-on Activities, Writing Activities, PhET Simulations, Sensor Activities, and Calculations Corners. These activities emulate both scientists and engineers.
- Section 8.3, The Stickiness of Water, contains the phenomenon activity, “Will the Raindrops Fall?” In this activity, students are instructed to poke small holes in plastic wrap held securely over a glass and predict what will happen when the glass is turned upside down. Once they have tested their hypothesis, they must integrate the previous lesson on water’s cohesive force to explain the result. After they have written out their analysis, they test several other scenarios (shaking the glass, adding dishwashing soap, etc.) and record and explain the results. Finally, they extend their knowledge to hypothesize and test the result of adding a hole in the bottom of the container.
- The Hands-On Activities ask students, “What similar activity could be done next to further study this concept?” This activity allows students to rethink, revise, and redo the activity.
- Unit 14, Medicinal Chemistry, discusses health and the human body chemistry. Student projects such as the chemistry of chemotherapy, pain relievers, and heart medicines involve science and engineering practices.

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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 a new phenomenon or problem. Examples include Section 5.2, Radioactivity, group work, where students create a bar graph estimating their annual exposure to radiation using the EPA's online radiation calculator.
- In addition, in the Presentation Activity located in Section 5.7, Nuclear Fission, students highlight the potential impact of current research on nuclear fission on our society. Using the methods of science, students conclude by expressing their opinions on the promises and dangers of nuclear energy.
- Chapter 7, Superfund Act, includes a concept check on the frequency of rain in Love Canal and a Think and Discuss section on the environmental disaster of Love Canal.
- Chapter 8, Winds From Water, includes a concept check on winds on Venus and a Think and Discuss section about weather changes based on water properties.
- Unit 14, Medicinal Chemistry, includes student projects on topics such as chemotherapy, pain relievers, and medicines for the heart.

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Indicator 6.2

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

1	Materials include information and/or resources that provide guidance for evaluating student responses.	M
2	Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level.	PM
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

Partial Meets | Score 1/2

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 minimal 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 information that guides teachers in evaluating student responses. For example, Section 9.1, "How Chemicals React," included this teacher's guidance:
    - 1. Focus on balancing only one element at a time. Start with the leftmost element and modify the coefficients so that this element appears on both sides of the arrow the same number of times.
    - 2. Move to the next element and modify the coefficients to balance this element. Do not worry if you incidentally unbalance the previous element. You will come back to it in subsequent steps.
    - 3. Continue from left to right, focusing on only one element at a time. Change coefficients as needed for that one element, and don't worry about messing up the other elements by doing so.
    - 4. Repeat steps 1–3 until all the elements are balanced.
- Materials provide examples of acceptable answers for evaluating student responses. For example, Chapter 2, "Contextual Chemistry: Green Chemistry Activity," concludes with the author's Responses to the Think and Discuss questions.
- Materials include resources that guide teachers in evaluating student responses.

- The “Instructor Resources” section in each chapter provides answer keys for practice pages, test bank questions, and questions embedded in the unit. These answer keys provide teachers with detailed explanations of question answers.
- The phenomenon activity "The Blue-Green Penny" in Section 3.2, "Elements are Made of Atoms," explains the phenomenon for evaluating the students' responses. The explanation includes: “Copper roofs tend to turn blue-green as they react with the carbon dioxide of the air and carbonic acid of the rain. A penny left outside in the rain for a long time will turn blue-green. The handling of a penny prevents the buildup of copper carbonate, and a penny at the bottom of a penny jar isn't exposed to very much carbon dioxide.”

Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students’ needs, in all areas of science, based on measures of student progress appropriate for the developmental level.

- The CAC Performance Guide explains how to provide feedback on student assessments, how to identify and respond to trends in student data, and also gives ideas for scoring from the student dashboard. However, the materials do not provide guidance to teachers on how to meet individual student’s needs.
  - Teachers can review student responses from concept and video checks to assess student mastery. The materials include a "Teacher Tips" section that can help teachers determine what and where the misconceptions are coming from and then add activities for students to address the areas of confusion. The materials include the ability for teachers to communicate with students directly by providing comments. Each assignment also lists the time the student is required to complete it. However, the materials do not guide the teacher on implementing the activities to respond to specific assessment data.
  - The CAC Performance Guide allows teachers to use feedback when designing their lessons. The Guide states, “For example, you might have been considering a more involved Hands-On activity as the next activity. Evidence from current student data, however, might well direct you instead to move to a gentler and easier to implement Practice Page worksheet activity.”
  - The materials include Test Bank sections that list each question's TEKS/ELPS and difficulty level. The results for the class can be compared to the national average for that assignment on an idealized Gaussian curve. However, there is no guidance on how to find more practice materials or resources about high/low-performing TEKS/ELPS.
  - For example, if students are struggling with naming compounds in Section 3.5, “A System for Naming Compounds,” there are activities provided, such as a writing activity, a practice page, review topics, and review questions with answers to odd-numbered problems. The materials provide suggestions to teachers for low-performing classes but no guidance on responding to individual students experiencing difficulty with the topic.
  - Chapter 7, “How Molecules Mix,” Homework Practice Session provides students with numerous questions in a game format. Students earn points and win medals. However, students do not get guidance on how to find more practice materials or resources about high/low-performing questions, and the materials do not guide the teacher on how to respond to specific assessment data needs.
  - Section 10.3, "Acidic, Basic, and Neutral," contains concept checks within the lesson. The teacher can use the data from the concept check to gauge students' needs and assign

activities accordingly. The teacher can assign a practice page, hands-on activity, phenomena activity, or practice calculations. However, It is up to the teacher to choose the direction to respond to data; the materials do not provide specific guidance and direction for the teacher on implementing these activities in response to individual students' needs from assessment data.

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

- The various assessment tools in the resource provide relevant information for teachers to use when planning instruction, intervention, and extension. Examples include:
    - The CAC Testbank provides questions covering each TEKS and ELPS. Questions are designated as easy, moderate, or difficult. Teachers can use student scores on these assessment questions to guide further instruction, remediation, or extension.
    - The materials contain multiple written assessments within the chapters to gauge student understanding. These writing assignments help the teacher identify students' struggles and modify upcoming activities and instruction. For example, Section 4.2, "Discovering the Electron'', includes multiple writing activities for students to gauge their understanding of the discovery of the electron. Teachers can assess the student's level of understanding before moving on to other areas of atomic structure.
    - The assessment tools embedded in each chapter help guide the teacher on what activities and instructions to do next. For example, many chapters contain "Next Time Questions," as in Section 6.3, "Ionic Bonds," which asks, “The lithium-ion, Li+1, and the nitride ion, N-3, get together to form an ionic compound. What is the chemical formula? a) LiN b) LiN3 c) Li3N or d) Li3N3." The teacher can use the students’ responses to plan the level of detail needed for the next day’s lesson.
    - Chapter 9, “Chemical Reactions” Instructor Resources, provides answers to Practice Pages and CAC Test bank questions from the chapter. Results from these assessments can be used to plan instruction, intervention, or extension.

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

- Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data. Evidence includes:
    - The "Handbook of Class Activities," located in each chapter's "Instructor Resources" which contains multiple activities teachers can use in response to intervention. The activities are ranked based on their level of implementation and value, and the TEKS and ELPS for each activity are contained. Teachers can use results from student data to determine which activities are appropriate.
    - The materials contain a "double-helical model," providing teachers with various activities for a single concept. For example, teachers might choose from "a writing activity, a literature search activity, a hands-on activity, a phenomenon activity, an online simulation, a project-based activity, a worksheet activity, or a hearts-on-community-building activity - each covering the same concept, such as momentum."

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- Chapter 12 contains practice pages, phenomena, writing activities, Next time Questions, hands-on activities, and homework practices that can all be used (or not used) to teach the concepts. Guidance is provided in the pacing and planning guide, Chapter outline, and Instructor Resources. Teachers can clearly see the activities provided and plan accordingly.
- The materials contain practice worksheets, pocket lab activities, and Just-in-time class activities that the teacher can assign, as well as group homework practice for students to earn medals and provide class competition. Depending on student needs, the teacher is also given many assessment choices, such as written, oral, and experimentation. "Just in Time" activities provide support to students who need more practice in a specific area.
- Each chapter contains a “Teaching Tips” section that guides teachers on effectively delivering the lesson. For example, Chapter 6, “How Atoms Bond” Teaching Tips, includes common student misconceptions for the unit, such as “Atoms are held together by a kind of glue.” It advises the teacher, “It works well to cover both Section 6.2 and 6.3 in one fell swoop, showing the formation of sodium chloride… Continuing with the presentation from Section 6.2, erase your renditions of Figure 6.4 for both sodium and chlorine...have the students “Ask Your Neighbor… metallic bonds are relatively easy to understand, but defy the traditional notion on chemical and physical changes when it comes to the formation of alloys.”

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Indicator 6.3

Assessments are clear and easy to understand.

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Assessments contain items that are scientifically accurate, avoid bias, and are free from errors. Examples include:
    - In Section 1.1, “Science Is a Way of Understanding the Natural World,” Review Question 1 asks, " What would have to be done to refute Aristotle’s hypothesis that heavier objects fall faster?" The answer given states, "An experiment." The question and answer are scientifically accurate, avoid bias, and are error-free.
    - Question 8 in Chapter 1, “Review,” asks, "Are medical X-rays used because they carry zero risks?" The answer states, "No, medical X-rays are used because the benefits of their diagnostic powers are judged to be greater than the risks of their causing cancer." The question and answer meet the criteria for this indicator.
    - In Video Check 3.1, students are asked, "What changes during a physical change?" The answer choices of “a) The physical attributes of a single material, b) Temperature, c) Mass, volume, and area, or d) Weight” are scientifically accurate, do not contain bias, and are free from errors.
    - The “Next Time Question” in Section 4.4, "Protons and Neutrons," is free from factual, grammatical, and scientific errors. The question also contains a descriptive answer that is free from error.
    - Question 19 in the Review for Chapter 5, "The Atomic Nucleus," asks students to compare and contrast a nuclear reactor with a fossil-fuel power plant. The question does not imply that one is better than the other. Instead, it asks students to make their own observations and draw their own conclusions.

- Section 16.3, "How We Pollute Water," covers point source and nonpoint sources of water pollution. Without bias, the lesson focuses on activities and areas where water pollution commonly occurs.
- Section 16.7, "Video: Climate Change Politics," is scientifically accurate and discusses the history of politics in climate change. It does not present a bias towards either side.

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

- Assessment tools use clear pictures and graphics that are developmentally appropriate. Examples include:
  - The materials frequently use fun drawings to illustrate complicated concepts. Fun drawings will better engage students with scientific concepts. Section 2.6, "Temperature and Heat Practice Page: Physical Quantities," includes a fun drawing to demonstrate various scenarios of particles of matter interacting in the real world. Section 2.8, "Gas Laws Practice Page: Gas Laws," includes a fun drawing demonstrating various scenarios of gas particles in the real world.
  - All five embedded resources on the atom provide students with clear diagrams and graphics on grade level and progress through difficulty as the student proceeds through their study of the atom.
  - The “Your Turn Question” at the end of Lesson 6.1, "Electron-Dot Structures'', contains a clear and easy-to-read graphic of the periodic table for students to use to answer the question.
  - The homework practice questions in Chapter 8, "How Water Behaves," include multiple graphics and visuals. These graphics do not contain any errors and can be clearly seen. The graphics align with the topic.
  - In Chapter 7, “Conceptual Chemistry Practice Page,” the graphics used are both clear and developmentally appropriate for high school Chemistry students. For example, the first section provides a graphic of positive protons, neutral neutrons, and negative electrons with appropriately scaled sizes.
  - Chapter 7, “How Molecules Mix, Conceptual Chemistry Practice Pages,” provides an illustration of the stages of water treatment. The illustration appropriately and clearly presents the material.

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

- Materials provide guidance to ensure consistent and accurate administration of assessment tools. Examples include:
  - A handbook on classroom activities in the “About this Program” section provides assessment techniques teachers could use to increase student learning.
  - Chapter 1 includes guidance to teachers for using the homework practice sessions. There are 103 questions in the practice sessions that include short answer and multiple choice questions. There is a section for points earned for each session.
  - The materials include “Key Terms” with review questions and flashcards embedded at the end of every chapter. An orientation video is provided that discusses how the teacher can use these resources.
  - Chapter 3, “Instructor Resources,” provides teachers with Conceptual Chemistry Practice Pages and a Test Bank to aid teachers in delivering assessments to measure student learning.

- The materials contain answers, explanations, and numerous choices for assessments and practice problems to ensure consistent and accurate administration of assessment tools. For example, Chapter 7 contains Practice Pages, 141 test bank questions, Checks for Comprehension, Phenomena, Hands-On Activities, Next Time Questions, and Simulations.
- Chapter 7, “Practice Homework Session,” provides over 100 questions. Students type in a short answer and may also request to view multiple-choice answers. The program automatically scores the answers and allows students to continue to practice as long as they choose.
- The materials include teacher guidance for formative assessment questions. For example, Section 10.3, "Acidic, Basic, and Neutral," contains a calculation corner for logarithms and pH. The practice contains answers to the questions and explanations of answers.

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

- The materials include a range of resources that teachers could implement to provide accommodations for students in assessments. For example, the Class Activity Handbook specifies what learner and assessment accommodations are offered for each type of activity. A Teacher Guide on Learning includes accommodations for students within activities and video lessons.
- The materials offer multiple assessment types. Assessment questions and activities are rated as easy, moderate, or difficult to allow for different student levels. The CAC test bank provides ELPS for test questions. Students can demonstrate mastery of knowledge and skills in different ways and levels. Additionally, the materials provide "Just-in-Time" activities that include different types of classroom assessment activities, such as minute quizzes, redemption quizzes, and pyramid exams. The materials include guidance for the teacher on implementing activities that could be used to fulfill student accommodations for formative assessments. For example, there are multiple formative assessment activities within the "Handbook of Class Activities" located in the "About This Program" section. These activities list the ELPS included in each and include multiple activities for the teacher to implement to fulfill student accommodations.
- Teachers can use resources such as Teaching Tips, "Just-in-Time" Class Activities, and guidance on “How to Study Effectively” to assist struggling students better and adjust their lessons and interventions accordingly.
- The CAC TestBank questions include the TEKS and ELPS covered and a difficulty rating. For example, question 799, from Section 7.7, covers ELPS 2.1 and TEKS 4 A and has a difficulty rating of "Difficult." Students can demonstrate their mastery of knowledge and skills aligned to learning goals. The materials include a Learning and Assessment Accommodations section to guide teachers with student accommodations.
- Chapter 12, "Instructor Resources," includes the answer key and explanations for the summative review questions for the chapter. The materials include a Conceptual Academy Chemistry Concept Inventory as a diagnostic tool to help teachers assess student understanding. These diagnostic tools also include shortened exams for students with IEPs.

Myriad Sensors Conceptual Academy Chemistry

Indicator 7.1

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- The “Just in Time” activities include different ways to assess students as they progress through the materials and also include targeted instruction for students who have not yet met mastery. The activities offered are flexible in that teachers are provided with multiple types of activities to choose from. The “Handbook of Class Activities” also allows teachers to implement variations of each activity depending on the student’s current level of mastery. In another example of targeted instruction, Section 3.6 offers suggestions for four different possible demonstrations for students and also includes background knowledge for teachers. Another method offered by the materials is exemplified in Lesson 11.1, Losing and Gaining Electrons. In this lesson, students check their understanding at five different points throughout the lesson. Students who have not mastered the content can review lessons in small chunks.
- The materials also include multiple ways to scaffold learning. For example, Section 7.4, Solubility, begins with the simple concept of solubility followed by video checks. The practice pages that follow begin simply but increase in difficulty. This practice is followed by a lab activity, and the lesson concludes with an over-arching phenomena activity (the greatest difficulty). We see student learning scaffolded as student questions and activities progress in difficulty throughout each chapter. The materials also offer a way to scaffold learning by having students answer questions in a gamified setting. Students earn badges, and the teacher can view these badges as an assessment to determine mastery. A final example is found in Chapter 4. After learning about nuclei, students perform a hands-on investigation, explore a phenomenon, and finally build the connections needed for an in-depth understanding of atoms.

Myriad Sensors Conceptual Academy Chemistry

Materials provide enrichment activities for all levels of learners.

- The material contains a variety of enrichment activities of varied complexities for a diverse range of learners. Each unit provides optional activities that the teacher can select to meet the needs of various types of learners. For example, Section 10.3, Acidic, Basic, and Neutral, contains five different activities of varied complexity that cover different types of solutions, their properties, and their pH. Chapter 10 also contains review questions with explanations for students who are struggling, as well as homework questions for students capable of independent practice. Many units include podcasts for auditory reinforcement, “Think About It” sections to encourage critical thinking, and “Next Time Questions” that allow students to plan future learning.
- The enrichment activities are optional and can be customized to fit the learning needs of the student at the moment. For example, Section 9.6, Chemical Kinetics, includes five different activities for the teacher to mix and match for the students. Students at lower to mid-level can complete the more concrete hands-on activities, while students at higher conceptual levels can complete the more abstract phenomenon activities.
- Other examples include Lesson 11.6, Electrolysis Produces Change. After students engage in a hands-on activity involving splitting water, there is a reading provided that goes into more detail about the phenomenon. Similarly, Lesson 13.2, Carbohydrates, includes an enrichment activity to polarize sugar water after students complete a drawing activity to identify carbohydrates.

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

- The materials include a handbook of “Just-in-Time” learning activities for teachers to present to students to develop their mastery of the desired topic. The handbook includes multiple guided activities that don't assume the student has already mastered the topics taught in the lesson. For example, Section 10.3, Acid Breath, walks students through the activity step by step. Students are given the information needed to understand each part of the problem as they progress through it. The materials also provide practice sessions where students answer questions and compete as teams in a gamified setting. Student groups earn badges as they master the concepts.
- The materials are scaffolded for all learners. Each unit includes sections with practice questions. As students progress through the material, they can check their work because answers are provided. The material also includes a test bank to give teachers a more concrete measure of student mastery. In addition, the materials often use group work to help all students achieve mastery. For example, in Lesson 5.6, Isotopic Dating Writing, students create concept maps in groups to help them make sense of new vocabulary terms.

Myriad Sensors Conceptual Academy Chemistry

Indicator 7.2

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- The material includes a variety of activities to engage students in each section. Examples include:
    - Lesson 3.3, The Periodic Table, includes videos with conceptual checkpoints, reading checks, general concept checks, and “Try On Your Own” questions.
    - The Phenomenon section of 4.1 asks students to think about how models depict objects and systems and include several relatable examples. Students watch a video and then build connections to the content.
    - In Lesson 5.2, Radioactivity Is Natural, students watch video lessons with several Checks for Understanding sections, read about the phenomenon of radioactivity, and then practice with problems before asking questions.
    - Lesson 10.3, Acidic, Basic, Neutral, includes a writing practice page, a hands-on lab, a phenomena activity, and a calculations activity.
    - Chapter 17, Capturing Energy, contains ten student projects for the teacher to choose from. There are also worksheets, videos, and video phenomena.

Myriad Sensors Conceptual Academy Chemistry

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

- The material provides guidance for grouping students in the About This Program section. You can also find multiple guides for how to implement grouping (individually, partners, small group, or whole class) within activities at the beginning of the "Handbook of Class Activities." Each activity also specifies the type of grouping that would work best. The materials even explain the differences between forming several small groups versus nation-building for competition purposes. Some lessons are constructed to use multiple groupings. For example, in Lesson 5.9, Nuclear Fusion, students pair up to discuss the answers before transitioning to the class as a whole group for further discussion.
- Within the materials, groupings are flexible. For example, Section 4.3 includes a hands-on activity, "Hidden Treasure," that can be completed with one, two, three, or four people per group. Individual groupings are also included, such as comprehension checks, reading checks, and writing activities. The Just-in-Time handbook gives guidance on different ways to form teams.

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

- The material provides multiple types of practices for students through individual learning, guided practices, and modeled practices. For example, Section 4.4, Protons and Neutrons, contains an example of each of these practices. The Lesson 4.4 section contains guided practices through video checks, concept checks, and reading checks. The Calculation Corner: Atomic Mass section contains modeled calculation problems for students to replicate on their own. This section also contains two PhET simulations that allow students to build an atom and manipulate isotopes. The materials also provide guidance for students to successfully complete practices within each chapter by including answer keys, worked-out problems, and explanations of critical thinking problems.
- The materials include a wide range of practice opportunities for students. For example, classroom assessment techniques like minute quizzes, RAT-a-CAT strategies, Redemption Quiz, etc., can be found in the About the Program section. Or in Chapter 5, Homework Practice, students answer questions in a gaming format to earn points. Teacher guidance on implementing activities throughout each unit can be found in the "About the Program" document.

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

- The materials represent a diversity of communities in the images and information about people and places. There are multiple "For Your Information" paragraphs embedded throughout each lesson that relate the information in the lesson to a diverse array of people and places. For example, the For Your Information section of Lesson 8.5, Water's Specific Heat, describes the Coriolis Effect and its impact on different regions of the oceans in the world. Additionally, the graphics in Section 4.5 include ethnic diversity in the video and in Figure 4.17. A video in Lesson 4.6 includes Spanish subtitles and ethnically diverse male and female narrators.
- The material also contains diverse descriptions and images of scientists and chemists. Podcasts of various professions included in the materials represent all types of backgrounds, ages, and people. Images included in the materials are also diverse, as in Chapter 13, Nutrients of Life,

which includes many images representing people of different ages, sexes, races, and professions.

Myriad Sensors Conceptual Academy Chemistry

Indicator 7.3

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

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

Partial Meets | Score 1/2

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

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

Evidence includes but is not limited to:

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

- The materials contain a sequenced list of all of the ELPS and their location within the chapters. ELPS are also indicated in the right-hand margin of the materials. They are also communicated in the About this Program section of the text and listed for every activity. Still, the teachers are not given guidance on how to use the activities within specific lessons.
- The materials contain multiple activities to be implemented by the teacher for each of the ELPS. Teachers and students can choose which activity they want to do, depending on the student's level of English development. The material also scaffolds the ELPS according to the level of complexity for each activity in which they occur but does not include guidance for the teacher on how to implement the ELPS within individual lessons. For example, the materials include a writing activity on nomenclature and storytelling for emergent bilingual (EB) students but do not provide guidance to the teacher on how to use the activity within a specific chapter or lesson.

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

- The materials strategically order the necessary activities to develop students' English proficiency. For example, the About this Program section lists ELPS beginning with Section 1 ELPS activities that leverage students' prior knowledge if they are beginning EB students and are relying more heavily on their first language. But in general, the materials do not encourage students' use of their first language in discourse in the activities to help their linguistic and

affective development in English. For example, the video in Lesson 2.1, "How Small Are Atoms," has closed caption capability in only two languages, English and Spanish.

- The materials include a list of many ELPS activities for teachers to choose from in the About This Program section. For example, if a teacher has an EB student who is Advanced-High, then they would need to use an activity toward the bottom of the list. ELPS from "Cross-curricular second language acquisition/writing" options are included in this section. Still, the materials generally do not encourage students to strategically use their first language to support their academic development in English.

In Section 6, Language Structures, students create a graphic organizer, view the prompt "Discuss what this sentence is saying," and then write down what they think it means. They then provide examples and make a list of all the key terms of this sentence, along with brief definitions. This activity allows students to use the language available to them and learn English while participating in the activity. Students are encouraged to use their field journals to build academic vocabulary and concepts throughout the course. The *How to Study Manual* can also be used to build cognitive and academic English, but the students are not being encouraged to utilize their first language.

Myriad Sensors Conceptual Academy Chemistry

Indicator 7.4

Materials provide guidance on fostering connections between home and school.

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials provide information to the teacher about the program's design that can be shared with caregivers. Presented within the materials is a guide on how to study effectively. It is designed to be used by students with their caregivers as they proceed through the course.
- For example, Chapter 1, Instructor Resources section, contains a draft letter to parents and caregivers. The letter details the kind of communication the caregivers should receive from the teacher and how frequently. It also mentions what information will be covered and provides them with a brief summary of the upcoming unit. For example, Chapter 6 includes a letter to inform parents of materials covered in the previous lesson and materials students will cover in Chapter 6. The letter also contains a link to a sample video for students and caregivers to watch at home.
- The Orientation Video for Students, Parents, and Caregivers in Chapter 1, Instructor Resources, provides an overview of the materials and the program's design. It also explains the intent of the course and how it can best be utilized.

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

- Materials provide information to the teacher to be shared with caregivers as a draft letter. The letter discusses class progress and can provide information to caregivers to help reinforce student learning and development. For example, Chapter 8, How Water Behaves, includes a draft letter for parents about what students will be learning in the unit. The Instructor Resources

also includes a link to share with caregivers and students on how to study effectively for the unit. This guide provides strategies for developing study habits and making learning "stick."

- Chapter 1, Instructor Resources, also includes support for teachers to use the flipped classroom model, including how caregivers can assist in learning at home. The materials also include videos for teachers to share with caregivers. For example, Chapter 4, Subatomic Particles, contains a sample teaching lesson to share. The video gives a quick, exciting lesson over some of the information that will be taught to students so that parents can be aware of what their students are learning and support them.

Materials include information to guide teacher communications with caregivers.

- The materials actually begin by detailing the importance of teacher communication with parents. It highlights the best methods to use to communicate with parents or caregivers about out-of-class assignments and provides example phrases to use. The materials provide a "How to Study Effectively" guide for the teacher to give students and caregivers to work with at home.
- The beginning of each unit also includes draft letters for teachers to share with caregivers. For example, Chapter 9, Chemical Reactions, includes a draft letter containing examples and information about what students will learn. In another example, the Chapter 2 draft letter states, "For this unit, we are studying how all materials around us are made of these ultra-tiny particles called atoms. Understanding the world from the perspective of atoms provides a deeper understanding of some key concepts we'll be using throughout the school year."

Myriad Sensors Conceptual Academy Chemistry

Indicator 8.1

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

Materials are accompanied by a TEKS-aligned scope and sequence outlining the order in which knowledge and skills are taught and built in the course materials.

- The materials include a pacing guide that lists the TEKS alignment for each chapter and section. Each chapter also includes teaching tips that are aligned with the TEKS. For example, Chapter 5, Teaching Tips, include a suggested order of topics and lists the relevant TEKS for each section of the chapter.
- The Teaching Tips for each chapter also list the Learning Objectives in order and Possible Misconceptions to Correct.

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

- Teacher directives are embedded throughout the chapter units, and the TEKS are included in the Lesson and Activity Pacing Guide.
- The materials include content-aligned teaching tips in each chapter. There are also ”Just in Time” Activities that include both TEKS and ELPS for each activity. For example, Chapter 2 includes an “Instructor Resource” tab that provides teaching tips and class activities to help teachers facilitate student-made connections across core concepts.
- Each chapter contains an instructor resource section that provides teacher guidance on not only what to say to students but what to say to parents/caregivers when introducing a topic. These resources include descriptions of modern phenomena and how they relate to other disciplines of science.

Myriad Sensors Conceptual Academy Chemistry

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

- There are multiple opportunities for students to review, practice, and develop mastery of knowledge throughout the course. For example, in the “Teacher Resources” section, you can find flashcards, key terms, matching games, review questions with answers to odd number problems, and video quizzes.
- Every chapter contains at least one hands-on lab activity that gives students the opportunity to review and practice their new knowledge. For example, In Lesson 9.5, after learning about entropy, students complete a hands-on activity that shows the transfer of energy and increase in entropy through the use of pennies. Students are given the opportunity to apply their newfound concept of entropy to a physical substance that they can visualize and manipulate.
- Checks for comprehension are embedded throughout the material in each section. For example, in Lesson 10.1, there are six different points where students are asked to record their thoughts and then are given an opportunity to check their answers.

The materials include frequent spiraling throughout the year. For example, Chapter 3, “Elements of Chemistry,” includes a review of key terms from previous chapters. In Chapter 5, Section 1 (a), “Radioactive Atoms,” the materials reference content learned in the previous chapter. This continues in other chapters, such as Chapter 14, which also includes concepts covered in previous chapters that spiral back and support mastery and retention.

Myriad Sensors Conceptual Academy Chemistry

Indicator 8.2

Materials include classroom implementation support for teachers and administrators.

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

Partial Meets | Score 1/2

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

Materials provide teacher guidance and recommendations for the use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning. Materials include standards correlations, but not 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 grade-appropriate use of safety equipment during investigations.

Evidence includes but is not limited to:

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

- The “Instructor Resources” section includes lesson plans, answer keys, podcasts, and teaching tips, including how to implement objectives and correct misconceptions. It also includes practice problems, a test bank, letters for parents, a chemistry handbook, and a guide to hands-on activities. For example, Chapter 6 begins with an Instructor's Guide containing information about the “Just in Time” activities included in the materials. The section contains numerous podcast teaching tips and a test bank of questions. The student materials contain embedded checks to monitor student comprehension.
- The “About This Program” State Standards section provides guidance on how to teach the concepts, scientific ways of doing and viewing, and implementation of the materials. Additionally, the “Handbook of Class Activities” section provides teacher guidance for actual classroom instruction.

Myriad Sensors Conceptual Academy Chemistry

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

- Lessons include cross-content material, but there is no guidance on which standard is covered at any given time. For example, Chapter 6.5(d) has cross-content standards labeled without further support. The writing and presentation activities included in the pacing guide do not correlate with the standards posted. For example, Chapter 10 discusses the process of ocean acidification, but the standards do not align with the lesson. Lesson 13.8 covers the chemistry of digestion and carbs, lipids, and protein macromolecules but does not mention the specific standards covered in chemistry or biology.
- The materials do not explicitly state the standards in the lessons, although the concepts covered in the material are correlated to the standards. For example, the podcast in Chapter 5 includes historical information. Students must use math to complete the practice exercises. Students must also use reading, writing, and comprehension skills to complete the assignments in the materials. However, neither TEKS nor standards could be found explicitly located within the materials. The Field Journal Best Practices gives both students and teachers guidance on what is expected from lab experiments using a rubric.

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

- Individual topics and activities are provided with equipment and supplies needed, and a complete materials list is found in the instructor resources of Chapter 1.
- Every lab activity contains a materials section at the beginning with all items the teacher needs for the lab. Phenomenon activities include a list of materials and sometimes a picture of materials needed to demonstrate the phenomenon.
- For example, the “What you will Need” section details a comprehensive list of materials required for each activity. For example, the lesson on “Developing a Model for Particle Motion” lists the materials required, such as a pocket lab thermo, jar, sand, and tape.
- For example, Chapter 6, Section 6, includes a hands-on activity. The information sheet lists the materials and equipment needed to complete the assignment. Video-based or simulation activities comprise the bulk of the activities and generally do not require supplies or equipment.

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

- The materials include embedded cautionary statements within the activities, reminders about personal protective equipment, and a detailed outline of safety practices and equipment for teachers to implement in the classroom. For example, the investigation on thermoelectric cooling, in which students set up a Peltier cooling laboratory, provides a cautionary statement in italics on the safe operation of equipment. In the Thermal Conductivity investigation, the teacher guidance reminds students about wearing goggles along with a caution reminder about hot water.
- The “About This Program” section contains guidance on the use and implementation of Safety Data Sheets and hazard diamonds. For example, the hands-on activity in Section 2.4, “Float or Sink,” includes a warning covering all the safety precautions necessary for completing the activity.

Myriad Sensors Conceptual Academy Chemistry

Indicator 8.3

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- The materials include a detailed pacing guide from days down to minutes required for lessons and activities. This recommended pacing guide can be adjusted if more or less time is required on a topic. Therefore, time can be managed strategically. The pacing guide also includes recommendations for the number of weeks to spend on each chapter.
- Each lesson within the pacing guide contains an exact number of minutes recommended for the lesson. For example, Lesson 4.4, “Protons and Neutrons,” should be completed within a 75-minute period. These timeframes take into consideration optional activities that can be removed without hindering the scope of the material being covered.
- For example, Chapter 1, “Lesson and Activity Pacing Guide,” states, “The TEKS/ELPS will be properly met by reaching Chapter 11 (Oxidation and Reduction). If you find yourself falling behind, simply skip chapter sections that are not TEKS bearing as indicated in this guide."
- There are many activities embedded in the resource. The teacher can adjust the timeline depending on how much time is available at the conclusion of the lesson. For example, if the lesson ends early, the teacher may opt to complete an extension activity, such as the International Space Station lab.

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

- The pacing guide includes a logical flow of information to be covered for the year. For example, Lesson 2.7 discusses the properties of the phases of matter before Lesson 2.8 delves into specific gas laws. The lessons within the chapters contain a logical flow of information that

builds from section to section. For example, Chapter 2, “Density,” covers ratios and examples of ratios before describing density as a ratio between mass and volume.

- Each chapter contains subsections with clear titles. Bold titles within subsections clearly designate materials covered. The chronological order of materials follows a developmental progression. For example, the first topic in Chapter 3 is Matter. This is followed by Section 3.2, “Classification of Matter.” The next topic is the periodic table, followed by compounds, and finally, naming compounds. There is a logical progression of topics for the matter section.

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

- According to the pacing guide, the materials can be covered in 36 weeks. This schedule includes 2.5 weeks for students to complete optional end-of-year projects. Each lesson contains a list of optional activities in the pacing guide that can be removed or rearranged as needed to accommodate time constraints while still covering all of the material.
- There are many activities embedded in the resource. The teacher can adjust the timeline depending on how much time is available at the conclusion of the lesson. For example, if the lesson ends early, the teacher may opt to complete an extension activity, such as optional student projects located at the end of each unit.

Myriad Sensors Conceptual Academy Chemistry

Indicator 9.1

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

1	Materials include an appropriate amount of white space and a design that supports and does not distract from student learning.	Yes
2	Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting.	Yes
3	Materials include digital components that are free of technical errors.	Yes

Not Scored

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

Materials include an appropriate amount of white space and a design that supports and does not distract from student learning. Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. Materials include digital components that are free of technical errors.

Evidence includes but is not limited to:

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

- The materials contain an appropriate amount of white space and a design that supports and does not distract from student learning. For example, the format used by these materials clearly presents organized information without distracting students from learning. For example, the lesson in Section 2.1, The Submicroscopic World, is presented as slides. The slides are easy to read and organized to support student learning. The type is spaced so that words are easily distinguished, margins are clear, and double spacing occurs between text and images.
- In Lesson 3.1, Physical and Chemical Properties, all materials are located inside the frame, while standards and a list of contents are on the side. This organization supports student learning and focus.
- The material contains a lot of white space that prevents students from being distracted when reading, watching a video, or answering questions. For example, in Lesson 3.2, “Video Check,” the materials provide enough space in between answer choices to minimize distraction. Lesson 8.2, Melting and Freezing, contains large margins of white space on the outer edges of the text. The only thing in the margins is a breakdown of the lesson agenda.
- The materials limit the information on the screen at a given point to prevent overstimulation and distracting students. For example, Section 10.4., Buffers Resist pH Change, shows a video on the screen by itself, then a question by itself, then a reading with a few correlated images. There are no extra images and information that surround or distract from the main focus of the page.

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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. Examples include Section 2.1, The Submicroscopic World, which begins with a graphic of the Periodic Table of Elements, followed by molecular structures, a picture of sand dunes and a glass of water, a graph showing ranges in masses and volumes of familiar items, and other relevant and appropriate images. Pictures and graphics are age appropriate and not visually distracting for learners. The Phenomenon in 2.1, "Zoom Into Water," shows a picture of swimming pool water, molecules of water, and a hand holding sand. The images are age appropriate and not visually distracting for high school chemistry students.
- Figures 3.9 and 3.10 of Lesson 3.2, Elements and the Periodic Table, stay within the frame, allowing students to scroll down to read the following information. This format allows for less distraction and more white space along the sides.
- Lesson 3.5, IUPAC Guidelines 1–3, includes drawing content within the frame, allowing students to scroll down to read the following information. This format allows for less distraction and more white space along the sides.
- The diagrams embedded in the text are age appropriate and correlate to the topic. For example, Lesson 9.6, Chemical Kinetics, covers how elements react to form new substances. It includes an appropriate diagram related to the topic showing the formation of nitrogen monoxide from the combination of nitrogen and oxygen.
- The images embedded in the text are engaging and informative for the students. For example, Lesson 11.7, Producing Metals, includes a picture showing the retrieval of pure copper. It shows the process on the molecular level and then includes a picture of copper being retrieved in an actual factory.

Materials include digital components that are free of technical errors.

- Materials include digital components that are free of technical errors. Examples include Section 2.1, The Submicroscopic World, which contains no technical errors in the digital version of text, visuals, or phenomenon. There were also no technical errors in the teacher resources for Section 2.1
- The materials contain multiple videos that play perfectly and are free of technical errors. An example is found in Section 3.5, "Naming Compounds" Video, which opens and plays with no errors.
- All the links in the materials open with no issues, as can be seen in Section 3.5, IUPAC Guide to Naming Inorganic Compounds.
- The materials contain multiple virtual labs that are free of technical errors. For example, Section 6.2, Ion Formation, contains a PhET simulation that covers Coulomb's Law. The simulation is free of errors.
- Section 11.6, Electrolysis Produces Changes, includes a hands-on activity that is free of technical errors.
- The materials also include several digital Pocket Lab Activities that are free of technical errors. For example, the PhET Simulation on "Balancing Equations" runs perfectly and is free of technical errors.

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Indicator 9.2

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

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

Not Scored

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

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

- Materials integrate digital technology and tools that support student learning and engagement. Examples include videos with checks to ensure students understand concepts that are included in most lessons. For example, the video in Section 2.4, Density is a Ratio, gives students meaningful instruction about density and engages them with the information.
- Additional examples of digital technology and tools are the “Pocket Lab Activities,” which involve the use of various pocket sensors. For example, the “Investigating Heat Islands” activity involves using a temperature probe to collect data.
- The materials contain multiple links to virtual simulations to promote students’ practicing concepts. For example, Section 5.3, An Imbalance of Forces, contains a virtual simulation called “Build a Nucleus.” This simulation engages students and helps them visualize the forces that go into holding a nucleus together.
- The “Sensor Activity: Mass Conservation,” in Section 3.2, requires students to read digital text, view a video and take notes in a digital notebook, digitally record answers to questions, and then construct an experiment. Students use a digital sensor to produce data, then record the data digitally and document their investigation in a digital notebook.
- The materials include engaging PhET simulations such as Section 3.3, The Periodic Table, “Build an Atom,” and Section 6.2, Ion Formation, “Coulomb's Law,” where students explore the forces between atoms when they bond.

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

- Materials integrate digital technology in ways that support student engagement with science and engineering practices and course-specific content. For example, in the pocket lab activity "Investigating Heat Islands," students in groups collect temperature data at various locations and then explore potential solutions to mitigate the effects of heat islands on locations.
- In Section 2.7, Phases of Matter, the materials include a PhET Simulation, "States of Matter," which requires students to manipulate variables, predict outcomes, and use observations to answer questions. Then the students reset the simulation and manipulate the variables again to create new outcomes. This digital technology supports student engagement with science and engineering practices that cover course-specific content.
- A PhET simulation in Section 6.8, Molecular Polarity, allows students to explore molecules' polarity as a computational chemist would.
- Section 9.7, Chemical Catalysts, includes a lab called "Catalysis." Students include all of their information for the lab, such as hypotheses, data, and conclusions, in their virtual field journal.

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

- Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate. For example, in the Pocket Lab Activity "Investigating Heat Islands," students work with their groups to answer questions after collecting data.
- The materials allow teachers to go into students' field journals to give them feedback. For example, Section 2.5, Energy Moves Matter, includes a phenomenon activity called "Energy." In this activity, students answer questions and include answers to research topics in their journals. The teacher can access the journals and give the students helpful insights or collaborate with them on ideas.
- Students can collaborate in virtual labs. For example, in the virtual lab "Concentration," in Section 7.3, Concentration and the Mole, students practice making various concentrations of solutions, and the teacher resources include collaborative activities for students.
- Most chapters include "Think and Discuss" sections that provide an opportunity for teachers and students to discuss each prompt and compare their understanding with the authors. Examples of Think and Discuss questions can be found in Chapter 9, Mercury Emissions, Think and Discuss, and Chapter 10, Ocean Acidification, Think and Discuss.

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. Examples include the Pocket Lab Activity, "Investigating Heat Islands," which is compatible with MacBooks and PCs.
- The materials include links to many PhET simulations to use as virtual labs. PhET is a widely used website that is compatible with most operating systems.
- Section 1.5, Chemistry is Integral to Our Lives, contains a video link to YouTube. YouTube is widely used through multiple operating systems.
- Section 10.2, Acid and Base Strength, PhET Simulation, "pH Scale" provides students with a web-based site for explorations that can be accessed by any learning management system.

- Section 10.4, “Video: Buffering Systems in Our Bodies,” provides students with a web-based video link that any learning management system can access.
- The materials can be used on Chromebooks, PCs, and iPhones. Content can be viewed, questions can be answered, and links work. For example, when using an iPhone, the link to the PhET simulation in Section 2.7 worked.

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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, except for caregivers.

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 are developmentally appropriate for the course and align with the scope and approach to science knowledge and skills progression. Each chapter includes a Chemistry Teaching Tips section that provides teachers with section guidance aligned to each TEKS.
- Additionally, Section 2.1 begins with a video that contains language, graphics, and content that are on-level and appropriate for high school students.
- The materials contain developmentally appropriate online videos embedded within the lessons. For example, Lesson 10.1, Exchanging Protons, contains a video at the beginning of the lesson. The video contains appropriate content and gives students a visual of how acids and bases exchange hydrogen ions.
- The materials contain virtual labs within the lessons that align with the scope and approach to science knowledge and skills progression. For example, Section 9.1, How Chemicals React, contains a virtual lab over balancing chemical equations. The virtual lab aligns with one of the objectives of the chapter, which requires students to balance chemical reactions. The Scope and Sequence for the materials also list the TEKS objectives included for this online activity.

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

- Materials provide teacher guidance for the use of embedded technology to support and enhance student learning. For example, teachers are provided with a section in the materials called the Lesson and Activity Pacing Guide, which provides a yearly overview for teachers implementing the course.
- Teachers are provided with an orientation video that provides an overview of how to use the materials, such as PhET Simulations, Sensor Activities, Writing/Presentation Activities, Hands-On Guided Activities, Video Phenomena Activities, Practice Pages, and Next-Time Questions.
- Each chapter includes a Chemistry Teaching Tips section. This section provides teachers with step-by-step suggestions on how to use space and materials to engage students better.
- The Instructor Resources also include notes on videos and podcasts embedded in the materials. For example, in Section 2.2, Phenomenon: Pixel Perfect, the Teacher's Corner section provides guidance for supporting and enhancing student learning.
- The materials include guidance for the teacher to embed technology to support student learning through the use of pocket lab sensor activities. For example, the materials contain the Sensor Activity, “Understanding Chemical Change,” in Section 3.3, Understanding the Periodic Table. The materials include guidance on how to embed the video and provide some useful example data, explain the data, and implement the procedures.
- The materials provide guided activities for the teacher to use when implementing labs. For example, Section 9.3, Grams to Moles, contains a virtual lab called “Reactants, Products, and Leftovers.” The page for the lab includes a link to guided activities for the teacher to use to implement the virtual lab into instructions.

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.
- The materials contain instructions for parents on navigating and utilizing the resources to help engage their students in the online components. For example, the Instructor Resources of Chapter 1, About Science, contains an orientation video for teachers to share with parents. The video walks parents through course navigation and explains how to utilize the different technological components. This video helps equip parents with the necessary information to help engage their students.
- The Instructor Resources for Chapter 2 include a draft letter to parents explaining that “we are studying how all materials around us are made of these ultra-tiny particles called atoms” in the unit. An overview of the content included in the unit, as well as some relevant information and an introductory video about atoms, are also included. The video is also provided as part of the student content, so parents can view exactly what the students are viewing.
- The materials include example video lessons for caregivers to guide them on the material students will cover in the unit and how the information will be covered. For example, the Instructor Resources section of Chapter 4, Subatomic Particles, contains a video link for parents over the atomic spectrum and fireworks. The video makes the parents familiar with the information covered in the chapter and the technology used to deliver it, so they can help engage their students in the materials.

- Chapter 7, Instructor Resources, Draft Letter to Parents and Caregivers, provides parents with an excerpt from this unit and an example video lesson on how municipalities purify our drinking water.
- Chapter 10, Instructor Resources, Draft Letter to Parents and Caregivers, provides parents with an excerpt from this unit and an example video lesson: this one with the author and his young daughter exploring the hills of Bryce Canyon.