PASCO SCIENTIFIC Essential Chemistry

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

Section 6. Progress Monitoring

- The materials include some 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 somewhat clear and easy to understand.

PASCO SCIENTIFIC Essential Chemistry

Section 7. Supports for All Learners

- The materials provide some guidance on fostering connections between home and school.
- The materials include some 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 some guidance, scaffolds, supports, and extensions that maximize student learning potential.

Section 8. Implementation Supports

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

Section 9. Design Features

- The visual design of materials is mostly clear and easy to understand.
- The materials are designed to engage and support student learning with the integration of digital technology.
- The digital technology or online components are mostly 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.

PASCO SCIENTIFIC Essential Chemistry

Indicator 2.1

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

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

Partial Meets | Score 2/4

The materials partially meet the criteria for this indicator. Materials are designed to strategically and systematically integrate some 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 some opportunities, as outlined in the TEKS, for students to ask questions and plan and conduct classroom, laboratory, and field investigations, and engage in problem-solving to develop an understanding of science concepts.

Evidence includes but is not limited to:

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

- The materials provide multiple opportunities to practice grade-level appropriate scientific and engineering practices outlined by the TEKS. In the Lab tab, there is a list of investigations associated with each chapter that require students to gather and analyze data, communicate results, and problem-solve. There are also four engineering design projects in the resource such as "Design an Insulator" and "Design an Airbag," that provide opportunities for students to develop, practice, and demonstrate mastery of TEKS-based scientific and engineering practices.
- The materials provide multiple opportunities to practice grade-level appropriate scientific and engineering practices, as outlined in the TEKS. For example, the book includes investigations for every chapter in the Lab tab requiring students to gather and analyze data and communicate results.
- For example, in Chapter 16, students can perform three investigations: "What is pH?" "Titration of an Unknown Acid," and an inquiry study on antacids. Four engineering project laboratory investigations are also included: "Design an Insulator," "Design an Airbag," "Design a Water Purification Process," and "Design a Galvanic Cell."

- For example, in Chapter 4: Investigations, students design an insulator using a variety of materials to keep a heated solution from losing less than 2°C over two minutes, which connects to the SEP, “Design, evaluate, and/or refine a solution to a complex real-world problem based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and trade-off considerations.”

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

- Materials strategically and systematically develop students’ content knowledge and skills appropriate for the course and grade level and correlate with TEKS. The contents are outlined in a strategic and systematic order to progress through content and skills to build understanding throughout the course. Items introduced early in the material, such as scientific notation, are utilized again in units to calculate moles. Investigations in the Lab tab also progress systematically from simple to more complex and provide opportunities to build upon prior knowledge. Interactive simulations provide a deeper understanding of content mastery through exploration.
- Materials are presented in a standard order and progress in a systematic order of content knowledge in the table of contents in the Book tab, within chapters, and in a table of contents for the Labs tab. For example, In Chapter 2, Lesson 1, students learn to use scientific notation. They utilize scientific notation again to calculate moles in Chapter 6. Calculating moles is outlined in TEKS 8B.
- The material includes interactive simulations for students to develop content knowledge through exploration. For example, in Section 13.1, students interact with a simulation of the dissolving process, while the teacher notes guide teachers to point out molecule orientations and charges.
- Within the Lab tab, the order of investigations strategically progresses from simple to complex and requires students to build on previous knowledge. The TEKS are not referenced within lesson plans, but learning objectives are stated. A footnoted section at the bottom of each lesson plan indicates which SEPs are included in the lessons.

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

- Materials offer many opportunities for students to conduct classroom, laboratory, and field investigations. These activities come with an essential question and a procedure. Some of those activities allow students to ask questions and design and conduct their own experiments.
- There are over 50 investigations that provide opportunities for students to engage in classroom, laboratory, and field investigations as outlined in the TEKS. Most of those investigations do not provide opportunities for students to ask questions or plan investigations. For example, Investigation 8A provides the procedure for students to follow to use stoichiometry to determine the amount of product. After the students have completed the procedure they are asked post-lab questions such as, "What evidence did you observe that indicated a chemical reaction was taking place?", "Explain the difference in the total mass before and after mixing." and "Do you see any Alka-Seltzer that has not reacted?". For Investigation 9A, students use beans to model subatomic particles using a provided procedure. After the students complete the procedure they are asked, "How many hydrogen isotopes did you find?", "How are they the

same? How are they different" and "Cobalt-60 is an isotope used as radiation therapy for cancer. How many protons and neutrons does cobalt-60 have?".

- For example, the “Student Assignments” table at the beginning of Section 8.3 links to Engineering Design Project 8E - “Project: Design an Airbag,” where students are tasked with designing an airbag that will inflate in 2 seconds or less.
- In the Lab tab, "3B-Pure Substances and Mixtures" requires students to plan and conduct an experiment to separate a mixture of four substances using an available set of equipment.
- The materials do not include sufficient opportunities for students to plan investigations and engage in problem-solving to develop an understanding of science concepts. Of the investigations included in the course materials, four are designed for students to engage in problem-solving. For example, Chapter 4 Lab E, Chapter 8 Lab E, Chapter 13 Lab D, and Chapter 18 Lab D are the only materials that provide opportunities for students to plan investigations and engage in problem-solving.

PASCO SCIENTIFIC Essential Chemistry

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

Partial Meets | Score 2/4

The materials partially meet the criteria for this indicator. Materials anchor some 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 some students' prior knowledge and experiences related to phenomena and engineering problems. Materials outline for the teacher some scientific concepts and goals behind each phenomenon and engineering problem.

Evidence includes but is not limited to:

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

- The material embeds phenomena and real-world problems across lessons to support building and developing knowledge and skills as outlined in the TEKS. The Standards tab includes a comprehensive list of TEKS linked to embedded scientific and engineering practices that appear throughout each chapter correlated to each TEKS. In the Book tab, many lessons provide passages that embed phenomena and problems that support the authentic building and application of skills and knowledge.
- Materials embed phenomena and problems across lessons. In the Standards tab, embedded links to the content addressing each TEKS are provided. The links guide you to the embedded SEPs for the chapter that are correlated to each TEKS. The Book tab contains many lessons with embedded phenomena and problems to support students in developing knowledge of course content and using SEPs. For example, the introduction to Section 13.3, Solution Concentration, begins by describing the proper concentration of potassium in human blood and the importance of maintaining its balance. Then, the math and computational skills to calculate concentration are introduced.

- The materials also include a “Connections” section to close each chapter describing a real-world scenario accompanied by a “Reading Support” reading response form that guides students to make connections from the article to the chapter. For example, Chapter 8: Stoichiometry includes "Engineering and Green Chemistry,'' and Chapter 12: Gases "Deep Dives and High Altitudes" to support students in building on knowledge through the authentic application of the content.

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

- Materials intentionally leverage students’ prior knowledge and experiences by pre-assessing them at the beginning of each chapter to identify preconceptions and misconceptions. The location of all prior knowledge from previously covered materials required for the current chapter and section is also included in each section lesson plan. How students’ prior knowledge and experiences are leveraged to support scientific and engineering practices is not evident.
- Materials intentionally leverage students' prior knowledge and experiences. For example, in the lesson plan for Chapter 7, Section 1, students are led through a discussion of bonfires and the chemical changes involved. Students are asked, “What happens to the atoms that are used to make up the wood? What are some fast ways to put the fire out? Where does ash come from? Why does a fire smell?”
- Some chapters, such as Chapter 7: Chemical Equations, pre-assess students' prior knowledge and misconceptions. This is found in the section at the bottom of the chapter introduction page titled “Assess Key Kontent.” Lesson 12.1 guides teachers to pre-assess the following questions: “How do gases produce pressure?”, “Do solids and liquids produce pressure?” “What are ways to increase the pressure of a gas?” and “How do you calculate the pressure of a gas when more than one gas is present?”
- Within the Book tab, materials include a sidebar at the introduction of each section linked to a one-page lesson plan for each section. One of the sections identifies where in the book prior knowledge has already been acquired by students. For example, for Lesson 8.1 in Stoichiometry, students must have prior knowledge from Chapter 2 (Measurement and Analysis), Chapter 6 (Moles), and Chapter 7 (Chemical Reactions).
- While leveraging students' prior knowledge and experience is present, relating that prior knowledge and experiences to scientific and engineering practices is not evident.

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

- Materials outline scientific concepts behind phenomena and scientific and engineering problems for teachers, but goals are not always provided for both.
- The course materials in the Book tab contain sidebars for each lesson. These sidebars contain links to one-page lesson plans per section. The lesson plans provide locations of science and engineering practices throughout the lesson, but goals for the SEPs are not always provided. For example, the Chapter 16, Section 1 lesson plan states that the SEP "using mathematics and computational thinking" will be utilized, but no goal is stated. The lesson plans outline for the teacher the SEP, disciplinary core idea, and crosscutting concepts addressed within the lesson.
- The course materials include four engineering project design investigations provided in the Labs tab, as well as the sidebar containing teaching resources for that section, which outline the scientific concepts and goals behind the engineering problem. The teacher lab directions contain

a background section describing the phenomena in detail, along with a performance criteria section that describes the goal for the engineering problem. For example, the performance criteria section for “4E: Design an Insulator” in Chapter 4: Temperature and Heat states that the insulation design company wants to "maximize profits by using the least amount of material while designing an insulator that minimizes the amount of heat lost."

PASCO SCIENTIFIC Essential Chemistry

Indicator 3.1

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

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

Meets | Score 6/6

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

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

Evidence includes but is not limited to:

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

- The materials include a link to Standards, which list all Science and Engineering Practices and Texas Essential Knowledge and Skills in numerical order and has links to locations within the course where each is presented. For example, “TEKS-1.A.i - ask questions based on observations or information from text, phenomena, models, or investigations” is featured in four locations within the materials.
- The materials connect learning goals of new knowledge and skills to previous learning goals across units. For example, in the Lesson Plan for Chapter 8, Section 1: Analyzing a Chemical Reaction," prior knowledge is referenced for Chapters 2: Measurement and Analysis, Chapter 6: Moles, and Chapter 7: Chemical Reactions. While the materials list the reference prior knowledge, they do not reference how this will build their knowledge and skills across units.
- The Teacher eBook contains a Chapter Study Guide that shows how the sections build and connect knowledge and skills within the lessons while pondering real-world phenomena.
    - For example, Chapter 19 begins with a brief description of how nuclear reactions differ from chemical reactions, followed by discussions of real-world examples, including smoke detectors, medical techniques, carbon dating, nuclear weapons, and nuclear reactors. Section 1 reminds students about the concepts of isotopes, balancing equations, the law of conservation of mass, and the speed of light, which were learned previously in the course, and demonstrates how they apply to nuclear chemistry. Next,

the types of radioactive decay and balancing nuclear reactions are presented, which lead to half-life calculations. Using this knowledge, students then study fission and fusion reactions and the energy that is produced. The last section discusses radiation and includes references to the electromagnetic spectrum, which was learned earlier in the course.

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

- The materials include a progression of concrete to representational before abstract reasoning when presenting concepts that allow for an increasingly deeper conceptual understanding. For example, Chapter 7, Lesson 1 will enable students to use an interactive equation builder and an atomic model set to explore the concept of balancing in Investigation 7A. A slide presentation scaffolds students by showing actual equations with formulas and symbols with pictures of the models alongside the formulas. After students learn the rules for balancing, they apply abstract reasoning to balance equations on a paper assignment without the need for drawing pictures or using models.
- The materials sequence instruction by activating prior knowledge before explicit teaching occurs to allow for deeper conceptual learning. Each section in the course begins with pre-assessment questions shown in the Teacher eBook and on the corresponding slide presentation. For example, pre-assessment questions for Section 12.1 on gases include: "How do gases produce pressure?" "Do solids and liquids also produce pressure?" and "What are some ways to increase the pressure of a gas?"
- Investigations are sequenced to build on prior knowledge before moving to more complex concepts. For example, in Chapter 7: Chemical Reactions, students first work with molecular models to balance chemical equations. Then, the students combine a variety of elements and compounds and make detailed observations to come up with a list of common indications that a chemical reaction has taken place. Finally, students understand that some ions in solutions are soluble and that others are insoluble.

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

- The materials provide a clear and concise roadmap using one-page lesson plans for each of the 81 sections. The lesson plans are aligned with course-specific concepts and SEPs, including hands-on practice in the form of investigations, contain concrete mathematical applications, and provide a variety of items to meet student learning style needs. However, the materials do not include resources for variation of instruction for differentiation and do not use a consistent instructional model such as Engage, Explore, Explain, Elaborate, Evaluate (5E) or Predict, Observe, and Explain (POE).
- The materials present course-level core concepts in a way that is scientifically accurate. Across the course, the lesson plans, student materials, and assessments accurately represent course-level core concepts and are free from scientific inaccuracies. For example, Chapter 19, Section 1, the Lesson Summary explains that “the nuclei of some atoms are unstable, leading them to decompose and release energy in the form of radiation. Examples of nuclear decay reactions include alpha (α), beta (β), gamma (γ), and positron emission (β+).”
- The materials clearly and accurately present Science and Engineering Practices. The materials list the science and engineering practice at the bottom of the lesson plan. For example, in

Chapter 19, Section 1: Nuclear Reactions, the SEPs “Developing and Using Models” is listed at the bottom of the lesson plan.

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

- Materials include a variety of mastery assessments that are within the boundaries of the main concepts of the course. For example, each chapter includes pre-assessment questions, section quizzes, and unit assessments, which span multiple chapters.
- The materials include specific learning targets within the lesson plans through the explanation of learning objectives. For example, the lesson plan for Chapter 7, Section 1 states, "The student will be able to: 1. interpret symbols used in chemical equations, and 2. construct and balance a proper chemical equation."
- The materials include a Chapter Study Guide, which has a bulleted list of learning objectives for the chapter. For example, Chapter 6: The Mole states, “By the end of the chapter, you should be able to” and then lists the bulleted learning objectives, which include calculating molar mass, converting between the number of moles and the number of atoms, or molecules in a substance, converting between the number of moles and the mass of a substance as well as the volume of a gas at STP, determining the percent composition for compounds, and calculating empirical formulas and using them in calculations involving molecular formulas.

PASCO SCIENTIFIC Essential Chemistry

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.	PM
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.	PM
3	Materials explain the intent and purpose of the instructional design of the program.	DNM

Partial Meets | Score 3/6

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

Materials provide some support for 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 but do not include course-level misconceptions to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS. Materials do not explain the intent and purpose of the program's instructional design.

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 provide a lesson plan for each section within a chapter, which lists the prior knowledge needed for that lesson. For example, Chapter 6, Section 3 indicates Chapter 6, Sections 1 and 2 under the prior knowledge heading. The prior knowledge for all the lessons cite chapters and sections within the e-book and does not cite prior knowledge from middle school TEKS. This supports teachers in understanding how new learning connects horizontally to previous learning in the course but does not support the teachers' understanding of vertical alignment.
- Lesson plans include a list of Science and Engineering Practices, Disciplinary Core Ideas, and Cross-Cutting Concepts. For example, Chapter 6, Section 1: The Mole, states the SEPs for this lesson is "using mathematics and computational thinking," the Disciplinary Core Idea for this unit is PS1.B: Chemical reactions and the Cross-Cutting Concept is Energy and Matter: Flows, Cycles and Conservation. While the materials include this information in the lesson plans, they do not include other guiding documents or information that supports the teacher in understanding the vertical alignment of course-appropriate prior knowledge and skills.

PASCO SCIENTIFIC Essential Chemistry

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

- The materials include extensions designed for students in the form of a More button embedded in the e-book at the end of certain paragraphs. This button allows students and teachers to choose to read more about topics that interest them. However, the materials do not support teachers by including complex course-level concepts beyond the course designed to improve the teachers' knowledge.
- The materials include lesson summaries to support the teacher's subject knowledge; however, the information does not support the understanding of more advanced, course-level concepts. For example, in Chapter 8: Stoichiometry, Section 2 Percent Yield, the materials state, “Theoretical yield is the maximum amount of product from a given amount of reactants. The actual amount of product formed is usually less than the theoretical yield. There are many reasons for this: impurities in reactants, side reactions, and product lost during purifications. Percent yield compares theoretical yield to actual yield." While this summary provides explanations and examples of science concepts, it does not offer support to the teacher's subject knowledge and recognition of barriers to the students' conceptual development as outlined in the TEKS.
- The materials provide pre-assessments to address misconceptions at the end of each section in a chapter. For example, Chapter 6 Section 1: The Mole, includes a pre-assessment that provides questions such as “How do chemists measure the mass of atoms and molecules if they are too small to see?” and “What is a *mole* and why is it such an important unit in chemistry?” While these questions are provided, information about common misconceptions is not provided for the teacher to address.

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

- The materials include The Essential Chemistry User's Guide under the Help menu, which explains the organization and features of the resource but does not include the rationale for the program’s instructional design.
- The materials offer fully editable lesson plans that cover 100% of the program’s core content but do not explain the lesson design’s intent and purpose.
- The materials include a Chapter Study Guide at the beginning of each chapter which previews the chapter and lists the learning objectives. For example, Chapter 1: The Science of Curiosity includes a list of learning objectives such as “distinguish among a hypothesis, a theory, and a scientific law” as well as a Chapter Preview that states, “Chemistry is the study of the basic structure and properties of matter as well as changes to matter and energy used or released by those changes.” The materials do not explain the purpose or rationale for the structure and design of the chapter.

PASCO SCIENTIFIC Essential Chemistry

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 grade-level appropriate scientific texts to gather evidence and develop an understanding of concepts. Materials offer numerous 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 investigations support meaningful sensemaking for students through reading, writing, thinking, and acting as scientists and engineers. For example, Lab 6A - Counting by Weighing asks students, "How can we determine the number of items in a very large sample?" before they engage with a written procedure that uses small objects such as beans to model particles. Students collect and analyze data and answer questions based on their results, such as, "How can the procedure be modified to improve the accuracy of the predicted versus actual number of particles in the sample?"
- The materials include opportunities for students to complete research projects that support meaningful sensemaking. For example, Chapter 4: Temperature and Heat includes Lab 4F - Research Presentation Enhancement: Insulators in the Home, which has students research the health effects associated with any material used for any sort of insulation in any part of a home.

Students then present their findings in a paper and presentation from the perspective of a home safety expert.

- Assignments included in the materials provide scenarios for students to support meaningful sensemaking. For example, Chapter 4: Temperature and Heat, Section 3: Heat and Changes of State includes an assignment titled “Two Cups.” In this activity, students read a scenario about two cups of tap water, one open and one covered in foil, and viewed an image supporting the text. Students then make predictions on the water level of the covered cup and design an experiment that uses a temperature sensor in the procedure. Finally, students conduct their investigations, record their findings in graphs and writing, and then explain the results by answering questions such as “What factor(s) caused your results?” and “What process(es) drove the phenomena you observed?"

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

- Each chapter contains an Essential Chemistry Connection and a reading response worksheet. Chapter 4: Temperature and Heat includes text titled Color Thermometers that allows students to read about leuco dyes and understand why they change colors based on temperature. Students connect this reading with what they have learned by answering questions like “Identify at least two chemistry concepts highlighted by this reading. Explain how the concepts are related to the reading.”
- The materials include resources within each chapter to master vocabulary as students engage with the scientific texts to develop an understanding of concepts. For example, each chapter's beginning and review sections contain a list of vocabulary words with hyperlinks to their definitions. In addition, the materials include a vocabulary crossword puzzle and a fill-in-the-blank vocabulary assignment to support understanding of scientific vocabulary.
- Each chapter begins with an introductory reading that allows students to preview the content before they dive deeper into the text. This initial reading provides context to students' content in each chapter section. For example, “Chapter 2: Measurement and Analysis” introduces students to the use of measurements and analysis in chemistry by stating, “As chemists perform experiments that generate more and more measurements, it becomes especially important to collect and visualize data in a meaningful way.”

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 provide multiple opportunities for students to engage in written and graphic modes of communication to develop an understanding of scientific concepts. For example, Chapter 10: Bonding and Valence, Section 2: Bond Types includes the assignment Trends and Bonding, which allows students to graph the atomic number on the x-axis and ionization energy and electronegativity on the y-axis. The materials instruct students to investigate patterns in the graph they created and answer questions based on their observations, such as “Compare the pattern shown by the ionization energy plot with the pattern shown by the electronegativity plot" and "Explain why the five elements you identified have the highest ionization energy, based on the definition of ionization energy."

- The 3D Learning Assessments allow students to respond to questions designed to provide opportunities for students to apply science and engineering practices, explain what they know about core chemistry topics, or make connections to unifying concepts using written and graphic modes of communication. For example, in the 3D Learning Assessment: Matter and Energy, students use models to explain how to conserve energy as it flows through different system parts under other conditions.
- Lab investigations included in each chapter allow students to engage in written and graphic modes of communication. For example, “Lab 12B: Boyle's Law” will enable students to communicate their findings for this lab by collecting and presenting data in a table, making a graph with the volume on the x-axis and pressure on the y-axis, writing a mathematical expression, drawing gas particles in a picture of a syringe to depict the gas at half the volume, and writing answers to questions such as "How do the pressure and volume data compare to your prediction?."

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 materials include Engineering Design Projects that allow students to problem-solve and engage in productive struggle as they make sense of concepts in the context of real-world problems. For example, Investigation 4E – Project: Design an Insulator has students use a variety of materials to design an insulated container with the goal of keeping a heated solution from losing less than 2℃ over 2 minutes. Students research insulators to help create and design their cups, collect data, create a prototype with set performance criteria and constraints, redesign their insulators after completing tests with their initial prototype, and present their project to an audience.
- The materials provide multiple opportunities for students to act as scientists who engage in phenomena through Investigations that begin with inquiry questions in each chapter. For example, Investigation 9D - Flame Test starts with the question, “How can you identify a substance based on the color of its flame?” To answer this question, students test known salts with different cations and record their observations in a data table before testing the unknown salt and determining its identity.

PASCO SCIENTIFIC Essential Chemistry

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.	PM
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

Partial Meets | Score 2/4

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

Materials prompt students to use evidence to support their hypotheses and claims. Materials include embedded opportunities to develop and utilize scientific vocabulary in context. Materials integrate some 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/or verbal arguments that justify explanations to phenomena and solutions to problems using evidence acquired from learning experiences.

Evidence includes but is not limited to:

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

- The materials include lab investigations that prompt students to use evidence to support their hypotheses and claims. For example,
    - Lab 13A - Electrolytes prompts students to test the conductivity of solutions and determine the difference between electrolytes and nonelectrolytes. After completing the lab activity, students answer questions such as "Based on your data, which solution is the better electrolyte?" and "Citing evidence from your data, explain the difference at the molecular level between what happens when salt and sugar dissolve."
    - Lab 1A - Experimental Variables allows students to understand the relationship between variables in an experiment. The materials prompt students to use evidence by asking, "Based on Part 2 of the experiment, do all colors fade at the same rate? What evidence supports your answer?"
    - Lab 4D - Heat of Fusion allows students to explore why temperature stays the same as the ice melts and asks students to answer the question, "Does the amount of thermal energy in the system before melting equal the amount of thermal energy in the system after melting? Use energy data from your experiment to support your answer."

- Lab 6C- Percent Composition of a Hydrate has students determine how you can tell the percentage of a portion of a compound and includes the question, “A hydrate is a compound with water trapped in its crystal structure. What happened to the hydrate as it transitioned to an anhydrous crystal compound? Support your answer with evidence.”
- Lab 7C - Solubility Rules allows students to perform a series of chemical reactions in response to the inquiry, "How can you identify the solid product when aqueous solutions are mixed?" After making observations, students enter their data into a chart where they indicate aqueous products and describe any formed solids. One of the analysis questions prompts students, "Note any patterns you notice regarding items that form aqueous and/or solid solutions. Cite evidence from your data that supports your claim."

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

- Materials embed opportunities to develop and utilize scientific vocabulary in context. The scientific vocabulary is shown in the Chapter Study Guide of each chapter and includes definitions when each word is clicked. The materials provide the definitions again when the word is clicked, as each word appears in context within the chapter. For example, in Chapter 9: Atomic Structure, Section 1: Atoms Have Structure, the materials include a paragraph on “The strong nuclear force” that states, “this force is (unimaginatively) called the strong nuclear force and it attracts protons and neutrons together.” The words “strong nuclear force” can be clicked and defined with an option to have it read aloud.
- The materials include section reviews and chapter reviews that provide opportunities for students to develop vocabulary in the form of vocabulary crossword puzzles and matching vocabulary to statements using a word bank. For example, the Chapter 5 Review includes statements such as “A quantity that is _____ has some regularly repeating pattern” and “A(n) _____ is a group on the periodic table,” where students must choose the words family or periodic to put in the blank.
- The materials include assignments that provide opportunities for students to utilize scientific vocabulary in context. For example, Lab 5A - Patterns and Trends allows students to reconstruct the periodic table using known properties of elements. Prompts such as, “One of the properties that you may not be familiar with is ionization energy. Use your textbook to define ionization energy.” and “Choose another property listed on the element cards that you are not familiar with and look up its definition. Describe your chosen property’s trends both down a group and across a period.” provide students with opportunities to connect scientific vocabulary to their hands-on learning experiences.

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

- The materials include a limited amount of assignments that provide opportunities for argumentation. In the Chapter 3 Section 1 Assignment: Atoms and the Periodic Table, students "Create reasonable arguments to support both sides of the following statement: Atoms are microscopic. Use the term ‘scale’ in both arguments." Guidance to provide an argument that agrees with the statement and an argument that disagrees with the statement is included in the assignment.
    - While argumentation is present in the above assignment, it is not present throughout every lesson. For example, Chapter 17, Section 2 Assignment: Oxidation Numbers only

allows students to write oxidation numbers for substances. Chapter 9, Section 2 Assignment: Photon Energy allows students to summarize atomic models and answer questions such as “Find the energy of the red photon (d) whose wavelength equals 656 nm.”

- The materials include Engineering Design Project activities that provide opportunities for argumentation and discourse, but they are not present in every chapter. In “Investigation 18E-Writing and Discussion Enhancement: Galvanic Cell," students “participate in small-group discussions to explore the question: What are the pros and cons of moving towards homes and cars powered primarily by rechargeable batteries?” Students fill out a peer grading rubric as they participate and end by writing a one-page summary in which the student expresses how thoughts and ideas about the issue build upon each other at each level of discussion. They end their summaries with a persuasive call to action to improve a specific problem that was discussed. While an Engineering Design Project is present in Chapter 18, no projects are in the chapters after (Chapters 19-24).

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.

- The materials include lab investigations in each chapter throughout the text. These labs allow students to construct and present arguments that justify their explanations using evidence acquired from the learning experiences.
    - In the Student Handout for Lab 8F-Research Presentation Enhancement: Airbags and Consumers, under the heading Add Context and Support, the materials state, “After thoroughly researching the airbag, organize ideas, concepts, and elements in a way that is meaningful for your audience. You must present data and evidence from your research and use complex scientific language in a way your audience can understand. Do you recommend the consumers use the product containing the airbag? Why or why not?”
    - In the Student Handout for Lab 18E- Writing and Discussion Enhancement: Galvanic Cell, the materials state, “You will participate in small-group discussions to explore the question: What are the pros and cons of moving towards homes and cars powered primarily by rechargeable batteries? After the discussion, you will take a moment to reflect about what you learned.”
    - Lab 10C - Surface Tension allows students to demonstrate surface tension and "provide evidence from this activity that supports the claim that water has a high surface tension."
- The materials include engineering design projects that provide students with the opportunity to construct arguments using evidence to justify explanations of phenomena and solutions to problems. For example,
    - In Lab 13D - Project: Design a Water Purification Process, students “use household items to purify water that contains macroscopic and microscopic contaminants.” After testing their design and re-testing their modified design, students write a 2-3 page report that includes the following, "Discuss the successes and failures in both of your designs. Discuss in detail the successes and shortcomings you had with each filtration material. Support your discussion with results from the investigation."
    - In Lab 8E - Project: Design an Airbag, students design and re-design an airbag that must meet specific design criteria. After collecting and analyzing data for their designs, each

team presents their project in a 3-minute presentation which "must include the data you collected which will justify the amounts of reactants used for the most ideal airbag." In addition, the presentation, "should also include justifications for either the use of or banning of child-sized airbags."

PASCO SCIENTIFIC Essential Chemistry

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

Partial Meets | Score 2/4

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

Materials provide some teacher guidance on anticipating student responses and using questioning to deepen student thinking. Materials do not include teacher guidance on scaffolding and supporting students' development and use of scientific vocabulary in context. Materials do not provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims. Materials do not support and guide teachers in facilitating the sharing of students' thinking and finding solutions.

Evidence includes but is not limited to:

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

- Materials provide some support for teachers to deepen student thinking through questioning. For example, within each lesson plan, the materials provide teachers with questions for whole group discussion. In Chapter 5, Section 1: The Past and Present Periodic Table lesson plan, the provided whole group discussion question states, "Describe a system you or a friend uses to make something easy to find. How many levels of organization or groupings are used? How could the system be improved to make it even easier to find things?" The lesson plans do not provide guidance on anticipated student responses.
    - The materials include opportunities for students to assess their learning by providing embedded Test Your Knowledge questions into the content of the text. For example, Chapter 5: Chemical Compounds, Section 1: The Past and Present Periodic Table includes embedded questions such as "A bond contains a single shared electron pair. Is the bond ionic, covalent, or metallic?" and "How many protons and electrons does a neutral atom of thallium have?" While these questions are included, there is no teacher guidance on the use of these questions to deepen student thinking.
- The materials include pre-assessment questions that assess students' prior knowledge and identify misconceptions. However, the materials do not provide guidance on anticipating student responses to these questions. For example, Chapter 4: Temperature and Heat, Lesson 1:

Temperature includes pre-assessment questions such as "What is kinetic energy?" "How is temperature related to kinetic energy?" and "What is 78 F in the Celsius scale and Kelvin?" The materials provide sample answers to these questions at the end of the lesson when students revisit the pre-assessment questions. The materials do not provide sample answers when the students initially answer these questions.

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

- The materials support students' development and use of scientific vocabulary in context but do not include teacher guidance.
    - The scientific vocabulary is shown in the Chapter Study Guide of each chapter and includes definitions when moused over. The materials provide the definitions again as each word is moused over in context within the chapter. For example, Chapter 3: Classifying Matter includes words such as element, the periodic table, mixture, and isomers and their definitions.
    - Section reviews and chapter reviews provide opportunities for students to develop vocabulary by completing vocabulary crossword puzzles and matching vocabulary to statements in context using a word bank. For example, Chapter 6: Moles includes vocabulary questions such as "The _____ is the simplest ratio of atoms in a compound." in the Chapter 6 Review.
    - While these activities allow students to use scientific vocabulary in context, there is no teacher guidance on how to scaffold or support students' development of scientific vocabulary.

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

- Materials do not provide teacher guidance on preparing for student discourse and supporting students in using evidence to construct written and verbal claims. For example, in Lab 8F- Research Presentation Enhancement: Airbags and Consumers, students present their findings "from the perspective of a consumer safety expert." The materials do not include teacher guidance for this activity.
    - The materials state, "After thoroughly researching the airbag, organize ideas, concepts, and elements in a way that is meaningful for your audience. You must present data and evidence from your research and use complex scientific language in a way your audience can understand. Do you recommend the consumers use the product containing the airbag? Why or why not?" While this allows students to use evidence to support a claim, there is no teacher guidance on preparing students for this.
- The materials provide an opportunity for students to engage in discourse but do not provide teacher guidance on preparing for that student discourse. For example, in the Student Handout for Lab 18E- Writing and Discussion Enhancement: Galvanic Cell, the materials state, "You will participate in small-group discussions to explore the question: What are the pros and cons of moving towards homes and cars powered primarily by rechargeable batteries? After the discussion, you will take a moment to reflect about what you learned." The materials do not provide teacher guidance to support student discourse within this activity.

PASCO SCIENTIFIC Essential Chemistry

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

- Materials do not support and guide teachers in facilitating the sharing of students' thinking and finding solutions. The chapters include numerous assignments and labs with answer keys but no guidance to facilitate students as they share their thinking and finding of solutions.
    - For example, Chapter 4: Temperature and Heat includes lab 4E - Project: Design an Insulator, where students design an insulator using provided materials and present their "initial and final insulator designs and overall findings" in the form of a sales pitch. The materials include a rubric for scoring the assignment and the oral presentation. To achieve an Excellent score in the area of Oral Presentation, students must be able to "address the design, data and/or cost adding some information that was pertinent to the sales pitch." While this shows evidence of students sharing their thinking, there is no support or teacher guidance for facilitating this sharing of thinking.
- Materials do not support and guide teachers in facilitating the sharing of students' thinking and finding solutions. For example, lab 8E - Project: Design an Airbag asks students to "design an airbag system that inflates in 2 seconds or less." The materials include Teacher Lab Directions and the Student Lab Directions with slight variation (i.e., the NGSS are included in the Teacher Lab Directions). No additional resources, support, or guidance are provided for this assignment in Teacher Lab Directions.

PASCO SCIENTIFIC Essential Chemistry

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.	PM
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

Partial Meets | Score 1/2

The materials partially meet the criteria for this indicator. Materials include some TEKS-aligned and developmentally appropriate assessment tools.

Materials include diagnostic, formative, and summative assessments that include formal and informal opportunities to assess student learning in a few formats. Materials assess some student expectations over the breadth of the course and do not indicate which student expectations are being assessed in each assessment. Materials include assessments that integrate scientific concepts and science and engineering practices. Materials include assessments that require students to apply knowledge and skills to novel contexts.

Evidence includes but is not limited to:

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

- The materials include a range of diagnostic, formative, and summative assessments to assess student learning. For example:
    - Diagnostic assessments, in the form of pre-assessments at the beginning of each section within the chapter's PowerPoint presentation, include only open-ended responses. For example, Chapter 8: Stoichiometry, Section 2: Percent Yield Pre-Assessment asks questions such as, "How can stoichiometry be used to keep an eye on efficiency?," Why aren’t the actual and theoretical yield the same number? and "What kinds of things can go wrong that decrease the amount of product you expect to be formed from a chemical reaction?"
    - Formative assessments exist as Test Your Knowledge prompts within the student text, Review problems and questions for each section of a chapter, student assignments, and investigations. The Test Your Knowledge, Investigation, and Review questions feature open-ended questions. Chapter Reviews present fill-in-the-blank and open-ended questions.
    - The materials include summative assessments for each chapter and unit. The chapter assessment questions include only multiple-choice style questions. The unit assessments

include open-ended questions and performance tasks. Section quizzes feature multiple-choice questions. This formatting is true for each chapter, section, and unit, with little variety in question types or formatting.

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

- Materials assess all student expectations. However, they do not indicate which student expectations are being assessed in each assessment.
    - The materials include a Test Bank on the Teacher Home Page that allows the teacher to select multiple choice questions of varying difficulty for each chapter to assess the covered standards. For example, Chapter 9: Atomic Structure, includes the following question, "Which of the following is true for Al3+?" Each question indicates which section of the materials the question correlates with but does not indicate the student expectation being assessed.
    - The materials include a “TEKS Chemistry Standard Correlations to Content And Assessments” document that lists all the TEKS and provides hyperlinks to at least two places where that TEKS is assessed. For example, the correlation document for TEKS 12.C “Differentiate between strong and weak acids and bases," contains a hyperlink to question 50 on the Chapter 16 review that states, "You are given a 100-mL sample of a strong base and a 100-mL sample of a weak base. Both have a concentration of 0.50 M. Which will have a higher pH value and what are some ways to confirm your answer? Explain." This Chapter 16 review itself does not indicate which student expectations are being assessed.
    - The materials include a range of diagnostic, formative, and summative assessments which assess all of the TEKS within the program materials. However, the individual assessments do not indicate which TEKS are being assessed either by whole assessment or by individual questions. For example, Chapter 9: Atomic Structure, Section 2: The Quantum Atom contains a Section 2 review that asks questions such as “Consider Rutherford's gold foil experiment. Suppose 99% of the alpha particles went straight through, but one alpha particle out of every hundred bounced backward. What conclusion could you draw about the size of the nucleus? Explain the reasoning behind your answer.” This assessment does not indicate which student expectations are being assessed in the overall assessment or any of the individual questions.

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

- The materials include several assignments in every chapter and at least one in most of the lessons. These assignments incorporate questions that integrate scientific concepts and science and engineering practices. For example, the unit assignment for Unit 6, 3-D Learning Assessment: Redox and Energy, integrates the Science and Engineering Practices by including a section titled “Nuclear power and the Control Rod simulation.” Students read a paragraph about nuclear power and then researched three arguments in favor of nuclear power and three examples of when the public objected to nuclear power due to a specific event. with nuclear energy concepts by asking students three questions. Students must summarize these examples in their own words. Lastly, students answer the question, "What is your opinion--are the benefits of nuclear power worth the risks? Why or why not?" by incorporating their knowledge of the content.

- Investigation Lab 4E - Project: Design an Insulator tasks students with designing “an insulated container with the goal of keeping a heated solution from losing less than 2°C over 2 minutes.” The materials state, "You work with a team of engineers at an insulation design company. A local coffee shop has asked your team to use the materials provided to create an insulated container that is low-cost and has high thermal efficiency. The company would like to maximize its profits by using the least amount of material while designing an insulator that minimizes the amount of heat lost. Your team's job is to design an insulator with the least amount of material to keep a heated solution from losing less than 2°C over two minutes."
- In Chapter 6: Moles, Section 1: The Mole, the SEP of Using Mathematics and Computational Thinking is included in the lesson plan and three sample assessment questions that integrate the SEPs with the scientific concepts. For example, the Section 1 Review asks, "How many atoms are in a 0.50 g sample of helium?" Then in Investigation 6A- Counting by Weighing students, "Calculate the mass of one mole of particles."

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

- The materials include Connections reading for each chapter that requires students to apply knowledge and skills to novel contexts. For example, the “Chapter 8: Stoichiometry” Connections reading about engineering and green chemistry includes a Reading Response Form which asks students to "Write at least one specific question related to this reading that you think is important to an everyday person. How would everyday life change if this question was answered?"
- The materials include a Review Problems and Questions section in each chapter that requires students to apply knowledge and skills to novel concepts. In Chapter 4: Temperature and Heat, Section 3: Heat and Changes in State Review Problems and Questions section, Question 2 asks students to "Make up a 1-paragraph story about how this energy bar diagram was made. In your story, identify the system and its surroundings, state whether a phase change occurred or not, explain the direction energy moved through the system and surroundings, and be creative!"
- In Investigation 5C- Store Labels and Model Building, students apply their knowledge and skills to a new problem of “identifying the chemical compounds on the ingredient lists of common household items.” Students inspect the ingredient lists of household items provided by the teacher and find as many chemical names as indicated by the teacher. Students record the formula of the chemicals and identify which household products contain that chemical. The students then build a model of the ingredient and draw a diagram of the molecule.

PASCO SCIENTIFIC Essential Chemistry

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

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 some information and/or resources that provide guidance for evaluating student responses. Materials do not support teachers' analysis of assessment data with guidance and direction to respond to individual student's needs, in all areas of science, based on measures of student progress appropriate for the developmental level. Assessment tools do not yield relevant information for teachers to use when planning instruction, intervention, and extension. Materials do not provide various resources and teacher guidance on leveraging 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.

- The materials include some information and/or resources that provide guidance for evaluating student responses.
    - All assignments, labs, and exams have answer keys or rubrics. For example, Investigation Lab 4E - Project: Design an Insulator has both an answer key to the analysis questions and a rubric for the project, Design an Insulator. The rubric provides examples of how a student's responses meet the criteria, such as "Temperature Change, Criterion Not Met (0 pts.), Temperature changes not measured."
    - While the materials have answer keys or rubrics, only the rubrics provide guidance for evaluating student responses. For example, in the answer key for the 3D Learning Assessment: Compounds and Reactions, a table is provided to guide teachers in evaluating students' responses. The rubric states, "You may wish to use the following table to evaluate student responses to questions that require explanations."
    - The materials provide a chart for students to use as a guide when answering questions but do not provide the same information for evaluating student responses. For example, the 3D Learning Assessment: Compounds and Reactions includes an Answer Guidance table for students that states, "Use the chart below to help you decide whether you have fully addressed each question or not." "Did I answer the Questions? No, the

answer is vague, is not supported with appropriate evidence, or does not address the question." This same chart appears in the answer key but is only intended for student use.

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

- The materials provide resources to evaluate student responses on all assessments but do not provide support for teachers in their analysis and interpretation of data to respond to individual students' needs.
    - Chapter 11: Energy and Change, Section 3: Entropy and Spontaneity begins with a whole group discussion where the class is divided into three groups, the first assembling as a solid, the second as a liquid, and the third as a gas. The materials guide the teacher to relate this activity to the concept of entropy by asking, "Which group has more freedom of movement; this also describes entropy." Next, the materials provide a slide presentation with four pre-assessment questions such as "What is the second law of thermodynamics?" and "What is entropy?" The materials do not provide guidance for teachers in the lesson plan or in the sidebar of the Teacher eBook on how to use these pre-assessment activities to respond to individual students' needs.
    - The materials do not include any type of overview sections, videos, suggestions, or supplementary documents for teachers to use to assist and support them in analyzing the assessment data. For example, the Chapter Study Guide includes a chapter preview, learning objectives, a list of investigations, and pages in this chapter. The Chapter Preview for Chapter 6: Moles states, "The molecular formula gives the actual composition of a molecule of a substance while the empirical formula only states the most simplified ratio of the elements of that compound." It does not provide any suggestions on what to do if assessment data shows students do not understand this concept.
    - The materials provide answer keys, but there is no connection to TEKS or support for responding to individual students' needs. For example, Chapter 3: Classifying Matter, Section 1: Atoms and the Periodic Table review has five questions, such as "An element has 33 protons. What group and period is it in?" Students can work on them on their own paper and then click show solution. No feedback is recorded and available to the teacher of their results.

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

- The assessment tools do not yield relevant information for teachers to use when planning instruction, intervention, and extension.

    - The materials include an online Test Bank tool that allows teachers to create assessments by generating tests and answer keys. The answer key allows the teacher to grade the test; however, there is no guidance on what to do with the information in regard to instruction, intervention, and extension gathered by administering these tests.
    - The materials do not include intervention or extension suggestions within the assessment tools, nor do the lesson plans incorporate assessment data when planning

instruction. For example, the Chapter 2 Section 1: Measurement and Numbers lesson plan includes learning objectives, prior knowledge, teaching tools, electronic resources, student work, sample assessment questions, and lesson plan segments. Information gathered from previous assessments does not tie into the next section's lesson plan.

- The materials embed assessments within the text by incorporating Test Your Knowledge questions and self-grading section quizzes. For example, Chapter 5: Chemical Compounds, Section 1: The Past and Present Periodic Table includes the Test Your Knowledge question, “What is the period number and group of the elements listed? Classify as alkali metal, alkaline earth metal, transition metal, halogen, noble gas, lanthanide, or actinide. Further, identify as either a main group element or transition metal.” The materials do not provide a tool to capture the data from these assessments to provide 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.

- The materials provide various resources but do not provide teacher guidance on how to leverage different activities to respond to student data. For example,
  - Chapter 4: Temperature and Heat, Section 1: Temperature includes an interactive Brownian Motion Simulator that instructs teachers, "The simulation will help students observe how particles within a substance move at different speeds and contribute to a single, average kinetic energy. When the particle trace is toggled on, a single particle will turn red. The color change helps students single out one particle. The particle has not changed its identity; it is chemically and physically the same as the other particles.” While the materials include this interactive simulation activity, they do not provide guidance on leveraging this activity in response to student data.
  - Chapter 16: Acids and Bases includes three lab investigations, six student assignments/worksheets, one vocabulary crossword assignment, one vocabulary fill-in assignment, four section reviews, four self-grading section quizzes that can be taken as many times as desired, and thirteen Test Your Knowledge questions embedded in the text. Students can reveal the answers to the Test Your Knowledge questions, self-grading quizzes, and section reviews. The materials do not guide teachers on selecting these activities based on response to student data.
  - The teaching resources provided for Chapter 12: Gases, Section 1: Pressure and Gas Behavior include a pre-assessment, a slide presentation, an investigation, a student assignment, an interactive simulation, a section review, and a quiz. For the pre-assessment, the materials state, “Begin the lesson by assessing students' prior knowledge and identifying misconceptions.” No guidance is provided for using these resources based on student data.

PASCO SCIENTIFIC Essential Chemistry

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.	PM
2	Assessment tools use clear pictures and graphics that are developmentally appropriate.	PM
3	Materials provide guidance to ensure consistent and accurate administration of assessment tools.	PM
4	Materials include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned to learning goals.	DNM

Partial Meets | Score 1/2

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

Assessments contain scientifically accurate items that are free from errors but do not avoid bias. Assessment tools use some pictures and graphics that are developmentally appropriate. Materials provide some guidance to ensure consistent and accurate administration of assessment tools. Materials do not include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned with 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. For example, Lab 8D - Determining Limiting Reactants includes the question, "Each trial used the same amount of NaHCO3. What happened to the pressure as you added increasing amounts of citric acid? Why did this happen?" The answer key provides the response, "The pressure increased, then leveled off after a certain amount of citric acid was added. The reaction must have stopped when the pressure stopped rising because no more gas was being produced." This item is scientifically accurate.
- Assessments contain items that are free from errors. For example, Chapter 9: Atomic Structure, Section 1: Atoms do have Structure self-quiz includes the question, "An isotope of tin is found to have 74 neutrons. What is the mass number of this isotope?" The answer is correctly identified as Sn-124.
- Assessments contain items that are not free from bias. The assessment tool only generates multiple-choice questions, which shows bias, since students have different backgrounds, language abilities, and thinking styles and demonstrate content mastery differently. For example, a test bank question with a Level 2 difficulty from Chapter 16: Acids and Bases, Section 2: The pH Scale reads, "The pH of a nitric acid solution was found to be too concentrated at a pH of 2.3. If you dilute the solution with pure water in a 100:1 ratio, what will be the pH of the new solution?" The materials provide five answer choices: a) 1.3; b) 3.3; c) 0.30; d) The pH of the solution will not change; and e) 4.3. All the generated questions for this section are multiple-choice.

PASCO SCIENTIFIC Essential Chemistry

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

- Assessment tools use pictures and graphics that are developmentally appropriate. However, some pictures and graphics are unclear.
    - Three of the four pictures generated in the Chapter 19: Nuclear Chemistry assessment depict the three types of radiation (alpha, beta, and gamma), and the fourth picture depicts a portion of the electromagnetic spectrum. The four graphics are labeled and easy to view. Below the graphic is an equation representing the alpha decay of Uranium-238 with arrows connecting the alpha particle in the graphic to the alpha particle in the equation. The assessment question states, "The following nuclear decay rations is an example of" and provides five multiple-choice choices.
    - In Chapter 12: Gases, Section 1: Pressure and Gas Behavior Quiz, one of the questions in the bank asks, "The total pressure in the flask below is 102.175 kPa, and the temperature is 25.0 °C. What is the pressure of hydrogen gas that was collected over water?" followed by a data table for vapor pressure and an image of the referenced flask with hydrogen and water molecules shown with a key to distinguish between the two. The image of the flask is blurry, even when zoomed in to 150%.
    - The Chapter 8: Stoichiometry, Section 3: Limiting Reactants Review Problems cover limiting and excess reactants. Question number five asks, "The information below was derived from an Interactive Equation. Based on the information, which reactant would be left over after the reaction if you started with equal amounts of moles of both reactants? Explain your answer." The information provided in the table to students for this question is an unclear screen capture image even when zoomed in on.

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

- Materials provide some guidance to ensure consistent and accurate administration of assessment tools. For example,
    - A pre-assessment is provided for each section in each chapter. The guidance for all of these is, "Begin the lesson by assessing students' prior knowledge and identifying misconceptions." At the end of each section, the materials state, "Re-visit the pre-assessment questions. Sample answers are listed below." No other guidance is given.
    - The Essential Chemistry User's Guide describes one of the features of the online test bank tool: "Tests can be created with multiple versions that have the same questions but with different numbers and different answers" for the quantitative questions. This feature leads to the reliability and consistency of test results between different but equivalent forms of tests. However, the user's guide does not provide guidance for teachers on how to administer the summative assessments, such as reminders, tips, and scripts to ensure the administration is consistent and standardized across examiners.
    - The Essential Chemistry User’s Guide states, “Essential Chemistry includes the following assessment components" and then describes the key features of each of these assessments (questions that start and finish a lesson, student assignments and investigations, page-level test your knowledge questions, section review questions, chapter review questions, and self-grading section quizzes.) The materials do not provide any guidance to the teacher on how to administer these formative assessments and how to collect consistent and accurate data from them.

PASCO SCIENTIFIC Essential Chemistry

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

- Materials do not include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned with learning goals. For example,
    - The materials include a test bank with items that can be edited, but no guidance is given suggesting what edits should be made. For instance, teachers can select from three difficulties and choose the number of questions from each section. Still, no guidance is given on selecting the questions to accommodate students when generating a summative assessment.
    - The materials include formative assessments, Word documents that can be edited to accommodate different learners through fewer questions, modifications to questions, adding pictures or graphics, etc. For instance, the student assignment pH and pOH in Chapter 16: Acids and Bases, Section 2: the pH Scale includes two tables requiring students to complete twenty-four pH calculations from multiple formulas. Teachers can edit the assignment with fewer questions and/or remove certain types of calculations. Still, the materials do not include guidance for teachers on when and how to edit the form for certain types of learners.
    - The materials do not offer accommodations for assessment tools, such as text-to-speech, highlighting, annotating, increased font size, or zoom features. The embedded quizzes include five multiple-choice questions that teachers cannot edit.

PASCO SCIENTIFIC Essential 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.	DNM
2	Materials provide enrichment activities for all levels of learners.	PM
3	Materials provide scaffolds and guidance for just-in-time learning acceleration for all students.	DNM

Partial Meets | Score 1/2

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

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

Evidence includes but is not limited to:

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

- The materials include activities such as section reviews and quizzes to determine students' mastery levels but do not provide recommended targeted instruction or activities for students who have not yet achieved mastery. For example, Chapter 8: Stoichiometry, Section 3: Limiting Reactants includes review problems and questions such as “Why does the limiting reactant determine how much product can form from a reaction?” and provides them with a self-quiz that includes randomized questions. While these materials provide opportunities for students to review content and help the teacher determine the students' mastery level, the materials do not provide support for students who have not yet achieved mastery.
- The materials provide opportunities for pre-assessment and revisiting the pre-assessment to determine student mastery of content but do not provide recommended targeted instruction of activities for students who have not yet achieved mastery. For example, “Chapter 18: Electrochemistry, Section 1: Fundamentals of Electricity” includes a pre-assessment with questions such as “What is a coulomb?”, “How does the charge of a proton compare to the charge of an electron” and “How does electricity flow in a solution?” Students revisit these questions at the end to show mastery of content, but there is no guidance or activities provided for the teacher to support students who have not yet achieved mastery.

PASCO SCIENTIFIC Essential Chemistry

Materials provide enrichment activities for all levels of learners.

- Some chapters include enrichment activities in the form of Research Presentation Enhancement and Writing and Discussion Enhancement labs that support the Engineering Design Projects. For example, Chapter 8: Stoichiometry includes Research Presentation Enhancement: Airbags and Consumers, which allows students to research an airbag type that seems interesting to them and write a research paper for the consumer. Afterward, students create presentations highlighting the major findings of their research. While these enhancement labs are included, they are not present in all chapters and do not provide differentiation for different levels of learners.
- The materials provide a Chapter Review at the end of each chapter that includes questions of varying difficulty, represented by the number of chili peppers (zero/one - easy, two - medium, three - challenging). For example, the Chapter 8 Review includes:
    - Vocabulary questions that include zero chili peppers, such as “The _____ is the substance that restricts the amount of product that can be formed during a chemical reaction.” Students select a word from the provided word bank and use it in the sentence.
    - Sentence writing and multiple choice questions with one chili pepper, such as “Write a chemical equation that is described in the following sentence. "In the production of concrete, solid calcium carbonate decomposes under heat to form solid calcium oxide and gaseous carbon dioxide."
    - Comparison and explanation questions with two chili peppers, such as “The mole is often referred to as a ‘*chemist's dozen*.’ What is the meaning of this comparison?”
    - Multi-step calculation and applying learned concepts to external sources questions with three chili peppers, such as “Give one example of a situation in which a chemist or chemical engineer would want to calculate the yield of a chemical reaction (amount of product produced)?”
    - While the materials include a variety of questions, ranging from easy to challenging, they provide enrichment for those students who are ready to accelerate their learning, not for all levels of learners.

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

- While the materials provide some opportunities to refresh students' memory and address misconceptions, they do not provide scaffolds and guidance for just-in-time learning acceleration for all students. For example, Chapter 4: Temperature and Heat, Section 3: Heat and Changes of State states, “Refresh students' memory: phase changes are physical changes. Many students have the misconception that boiling water is a chemical change. They think the bubbles come from "hydrogen and oxygen gas when water molecules separate." Emphasize that the bubbles in liquid nonboiling water are trapped air, then during boiling, water in the vapor phase.” While this statement addresses misconceptions that students may have, it does not provide the teacher with guidance for just-in-time learning acceleration.
- The materials provide the teacher with Sample Assessment Questions in each lesson plan, such as, "Describe a situation where two objects made of the same kind of material can have the same temperature but different amounts of heat energy” located in the lesson plans Chapter 4 Section 2: Thermal Energy and Heat. While the materials provide these sample questions, they do not provide guidance or scaffolds for just-in-time acceleration that allows teachers to re-

engage students with questions, cues, or prompts when students are struggling, stuck, and unsure how to proceed on a task.

PASCO SCIENTIFIC Essential 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.	PM
2	Materials consistently support flexible grouping (e.g., whole group, small group, partners, one-on-one).	PM
3	Materials consistently support multiple types of practices (e.g., modeled, guided, collaborative, independent) and provide guidance and structures to achieve effective implementation.	PM
4	Materials represent a diversity of communities in the images and information about people and places.	PM

Partial Meets| Score 1/2

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

Materials include some developmentally appropriate instructional approaches to engage students in content mastery. Materials support some flexible grouping (e.g., whole group, small group, partners, one-on-one). Materials support some types of practices (e.g., modeled, guided, collaborative, independent) and provide guidance and structures to achieve effective implementation. Materials somewhat 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 materials include some variety of instructional approaches. For example, the Chapter 1 Section 1: The Science of Matter and Change Lesson Plan guides teachers to begin with a whole group discussion, has students work in small groups on Investigation 1A: Experimental Variables, and then shows students a slide presentation. The lesson plan includes individual student work, such as Section 1 Assignment: Science and Your Career (Part 1) and Section 1 Vocabulary (1_1_vocab).
    - While the materials include some variety in instructional approaches, each lesson plan follows the same format and includes the same content, with little variation in instructional approaches. For example, the Chapter 8 Section 3: Heat and Changes of State Lesson Plan includes additional investigations for students to complete in small groups, such as 4E – Design Project: Design an Insulator and 4F – Research Presentation Enhancement: Insulators in the Home while also including the same whole group discussion, investigation, slide presentation and student work format that is present in every lesson.

PASCO SCIENTIFIC Essential Chemistry

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

- The materials support some flexible grouping. Every lesson plan included in the materials provides opportunities for whole-group instruction and individual work. For example, the Chapter 8 Section 1: Analyzing a Chemical Reaction lesson plan begins with a whole group discussion to “introduce students to stoichiometry by showing them they are already familiar with it.” Students then work in small groups to complete Investigation 8A - Conservation of Mass and finally complete individual student work in the Section 1 Review and Section 1 Quiz portions of the eBook.
    - Small group Investigation activities are not consistently present in all lessons throughout the materials.
- While the materials provide students the opportunity to be a part of many different types of groups, they do not provide the teacher with guidance on how to support flexible grouping. For example, there is no guidance on how to group students based on their interests, needs, or learning styles. The materials suggest students work as a whole group, with their lab partner, or in small groups but do not suggest how to form these groups to support flexible grouping strategies.

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

- Materials support whole group instruction, small group, pairs, and independent work. For example, every lesson includes a section for discussion ideas. Some of the lessons, such as Chapter 10: Bonding and Valence, Section 1: Chemical Bonds, direct teachers to ask the whole class a question, while others prompt them to put students in groups of 3-4.
    - Lesson plans for each section include icons to indicate the group structure for each activity. For example, the Chapter 10 Section 2: Bond Types lesson plan includes an icon of a single person(intrapersonal) on the Electronic Resources and Student Work activities and an icon of a group of people(interpersonal) on the Whole Group Discussion and Investigation activities.
- While materials support multiple types of practices, they provide limited guidance and structures to achieve effective implementation. For example, the Chapter 3 Section 1: Atoms and the Periodic Table lesson plan includes a whole group discussion activity with the group icon that states, “Challenge students to think on the atomic scale. Ask students the question, how many atoms do you think are in a drop of water? Remind students they already know that every water molecule is made of 3 atoms (H2O). (There are about 5 x 1020 atoms in an average drop of water.)." While this provides some guidance, it does not provide information about how to achieve effective implementation and is not present in all activities on the lesson plan (i.e., the Electronic Resources individual activity states Interactive Periodic Table and provides no other information or guidance for the teacher).

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

- Information about people and places is limited. Some information about scientists credited in the field of chemistry is available. For example, in Chapter 12: Gases, Antoine Lavoisier is pictured in a drawing, and information on his role as the "father of modern chemistry" is provided.

- The materials include few images, and the information accompanying the pictures does not describe the people in the picture. For example, in Chapter 21: Molecular Biology, Section 4: Nucleic Acid, there is a picture of several people in what appears to be a club or party setting. When the mouse is held over the pop-up information, the message says, "One human cell nucleus contains over 6 billion nucleotides; only 1% of your DNA makes you unique."
- The materials do not provide many images of people, and the provided images show little diversity. For example, Chapter 21: Molecular Biology, Section 1:Carbohydrates includes a picture of a group of people eating pizza, but they appear to be all of the same ethnicity.

PASCO SCIENTIFIC Essential 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.	DNM
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 do not include guidance for linguistic accommodations (communicated, sequenced, and scaffolded) commensurate with various levels of English language proficiency as defined by the ELPS. Materials encourage some strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English.

Evidence includes but is not limited to:

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

- Materials do not include guidance for linguistic accommodations commensurate with various levels of English language proficiency. For example, in the Standards Correlations to Content and Assessment Tab of the Teacher eBook, a list of the English Language Proficiency Standards is provided with links to assignments that address each of the ELPS. ELPS-5.B.1 (write using newly acquired basic vocabulary) links to "18E Writing and Discussion Enhancement: Galvanic Cell," in which students must choose a topic and research the pros and cons of moving toward homes and cars powered primarily by rechargeable batteries. While the materials link this assignment to the ELPS, no guidance is given to support various levels of English language proficiency through accommodations.
- The materials provide lesson plans that include learning objectives, teaching tools, student work, lesson plan segments, and sample assessment questions. Linguistic instruction is included, but no various levels or further guidance for accommodations is included. For example, the lesson plan for Chapter 1 Section 1: The Science of Matter and Change includes linguistic assignments and whole group discussions where students "Share an example of a time you used your
critical thinking skills to come to a decision or a conclusion." While these activities support the use of speaking, reading, writing, and listening, they do not provide any accommodations for Beginning, Intermediate, Advanced, or Advanced High Emergent Bilingual students as defined by the ELPS.

PASCO SCIENTIFIC Essential Chemistry

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

- Embedded videos in the teacher sidebar allow students to auto-generate closed captioning in different languages, which encourages the use of students' first language and promotes academic development in English. The materials lack tips and support for teachers about the importance of allowing students to speak and learn in their first language.
- The Essential Chemistry User Guide indicates that "Glossary words appear in bold blue type. Clicking glossary words opens the definition in a floating window, and Definitions can be toggled between English and Spanish. Definitions can be read aloud in either English or Spanish." While the materials include this option, the extent of language support is limited. They do not encourage strategic use of students' first language in any other places within the materials.
    - The materials include labs, assignments, engineering design projects, written and verbal discussions, section and chapter reviews, presentations, and vocabulary assignments. These materials do not encourage using students' first language, and no guidance is provided to accommodate these activities in the student's first language.
- The materials in the Teacher eBook are "Teacher Resources," located in a sidebar on the left of every section. This sidebar appears on every page and contains links to items for the specific section of the book, such as lesson plans, slide presentations, investigations, student assignments, and answer keys. Depending on the page within the section, the sidebar also contains additional resources for the teacher, such as the lesson summary, explanations about common misconceptions in reference to the pre-assessment questions, explanations and answers in reference to the slide presentation, answers to the section review problems, and answers to the chapter review problems.

PASCO SCIENTIFIC Essential 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.	PM
2	Materials provide information to be shared with caregivers for how they can help reinforce student learning and development.	DNM
3	Materials include information to guide teacher communications with caregivers.	DNM

Partial Meets | Score 1/2

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

Materials provide information to be shared with students, but not caregivers, about the design of the program. Materials do not provide information to be shared with caregivers for how they can help reinforce student learning and development. Materials do not 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 do not provide information to be shared with students and caregivers about the program's design. Other than a User's guide provided to the teacher, there is no other evidence present to share with students and caregivers about the program's design.
- The Essential Chemistry User's Guide provides information about the program's design for students and teachers in the same document. For example, the organization and navigation of the Student ebook and Teacher Edition ebook are provided along with descriptions of the components provided within each ebook.
    - The guide also explains to students that "four different design projects with four supporting research enhancement assignments are included in the Essential Chemistry lab manual. These projects provide experience with student-designed investigations. Projects are an ideal introduction to the engineering design process."
    - While the materials provide information to be shared with teachers and students about the program's design, there are no documents or information provided to share with caregivers.

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

- The materials do not provide resources and strategies for caregivers to help reinforce student learning and development. The materials do not include letters to families, extension activities that involve caregivers, or suggestions for fostering children's curiosity within the program.

- The materials include some activities that require students to use materials gathered from home. However, no information is included in these activities to be shared with caregivers for how they can help with the activity or reinforce student learning and development. For example, “Chapter 16: Acids and Base, Lesson 2: The pH Scale” includes an activity that encourages students to think about liquids in their homes, such as cleaning supplies and items in the refrigerator. Students then "bring a small amount of 4 different liquids from your home" to design an experiment to test their predictions for the pH of these liquids and to compare results with others in the class to look for patterns. There is no evidence of the involvement of caregivers in this activity.

Materials include information to guide teacher communications with caregivers.

- Teacher guidance materials do not include information on engaging caregivers as partners in learning, nor do they offer suggestions for establishing a relationship, inviting ongoing communication and partnership, or sharing progress updates.
    - The materials include an Essential Chemistry User's Guide that details features of the eBook, the digital teacher’s edition, online use, access codes, and assessments. This document is designed for the student book and teacher’s edition and does not include information to guide teachers on communication with caregivers.
- The materials include a Teacher eBook with a teacher sidebar throughout, providing additional resources for teachers. The sidebar in the Teacher eBook includes lesson overviews, key content to present and assess, and prompts for the lesson. Still, it does not include any resources to guide teachers' communication with caregivers.

PASCO SCIENTIFIC Essential 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.	DNM
2	Materials provide clear teacher guidance for facilitating student-made connections across core concepts and scientific and engineering practices.	PM
3	Materials provide review and practice of knowledge and skills spiraled throughout the year to support mastery and retention.	PM

Partial Meets | Score 1/2

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

Materials do not include a TEKS-aligned scope and sequence outlining the order in which knowledge and skills are taught and built in the course materials. Materials provide some teacher guidance for facilitating student-made connections across core concepts and scientific and engineering practices. Materials provide some 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 do not include a scope and sequence that outlines the order in which the TEKS are taught. There is a list of TEKS linked to resources throughout the material, but it does not reflect the sequence in which they are taught.
- In the Standards tab at the top of the home page, a detailed index of TEKS linked to locations in the product aligned with each standard is available.
- A year-long scope and sequence that outlines the order in which the TEKS are taught is not evident in the course materials.

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

- There are resources available that provide the opportunity for students to investigate content through the use of core concepts and scientific and engineering practices, as well as indicators to teachers where and how content is connected to these concepts and practices. However, within those resources, there is little to no teacher guidance to facilitate student-made connections across core concepts and scientific and engineering practices.
- Within the lesson plan of each unit, teachers are provided with a "Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts" table, as identified by the Next Generation Science Standards, at the bottom of the page to illustrate how the lesson connects

to core concepts and scientific and engineering practices. There is no clear guidance for teacher facilitation of student-made connections to these concepts.

- Each unit provides multiple opportunities for student-made connections during investigations that align with scientific and engineering practices, such as lab 14A, “Optimum Conditions,” where students collect data and construct graphs of changes over time during chemical reactions. However, teacher guidance for facilitating student-made connections is vague.

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

- A lesson plan at the introduction of each chapter identifies content from prior chapters that will serve as background knowledge, but there is no evidence that the students are provided opportunities to practice and review prior knowledge for mastery and retention spiraled throughout the product.
- A lesson plan at the introduction of each chapter identifies content from prior chapters that will serve as background knowledge, but there is no evidence that the students are provided opportunities to practice and review prior knowledge for mastery and retention throughout the product.
- There is evidence of knowledge and skills practice throughout the year as content requires. For example, in Chapter 8, Section 1, students work with mole ratios. Students were introduced to the concept of a mole in Chapter 6.

PASCO SCIENTIFIC Essential 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.	PM
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.	PM

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

Evidence includes but is not limited to:

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

- The materials provide teacher guidance and recommendations for the use of many materials at the beginning of each chapter lesson, embedded into an interactive lesson plan that includes slide presentations, notes, assignments, investigations, reviews, assessments, and answer keys. A 54-page User's Guide also exists with links to videos and online support to assist teachers in using supplemental software, using and modifying the assessment bank, interactives, and general navigation of digital materials. Teacher guidance and recommendations for enrichment activities, scaffolds, and instructional strategies are not present.
- Materials provide interactive lesson plans at the beginning of each section with teacher guidance on slide presentations, notes, assignments, investigations, reviews, assessments, and answer keys. The lesson plan supports teacher guidance since lesson resources correspond to the content in the textbook. For example, in the lesson plan for Chapter 20, Lesson 20A, teachers are given clear instructions for leading students through an opening activity. This level of guidance appears in each lesson plan and lab.

- Under the Help menu on the Home page, the materials include a 54-page User's Guide with links to videos and online support to assist teachers in using supplemental software, modifying the assessment bank, using the interactives, and general navigation of digital materials. However, guidance and recommendations for enrichment activities, scaffolds, and instructional strategies are not present.

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

- Lesson plans state the learning objectives for the lesson for the specific unit, though they are not stated as TEKS. However, an interactive Standard Correlations to Content and Assessment guide at the beginning of the material lists the TEKS number, TEKS description, and location of resources as well as links to the content.
- Lesson plans state the learning objectives for the lesson for the specific unit, though they are not stated as TEKS. For instance, in the lesson plan for Chapter 9, Lesson 1: Atoms Have Structure, learning objectives are written as "The student will be able to: 1. compare properties of isotopes of the same element, and 2. explain the balance of nuclear forces within the nucleus." This is not directly correlated to any TEKS for atomic structure; Texas standards do not expect students to compare properties of isotopes of the same element nor explain the balance of forces within the nucleus within the atomic structure or nuclear chemistry standards.
- The Interactive Standard Correlations to Content and Assessment guide found in the Standards tab on the Home page lists the TEKS number, TEKS description, location and type of content in the materials, and a link to the content. Here, the page numbers provided for each standard's location are found in the student text. This guide also links the English Language Proficiency Standards (ELPS) to locations throughout the resource. However, there are no TEKS within the context of the content, nor are the ELPS connections throughout the material explained.

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

- A list of materials for all laboratory and instructional activities is provided within each activity, as well as within a year-long list of supplies and materials, including quantities, provided in the Safety chapter of the resource.
- In the Table of Contents in the lab book, a comprehensive materials list of non-consumable and consumable materials is provided. Within the list, the year-long quantity per group and which lab investigation will require the materials are included. Materials also include a lesson plan in each chapter section. The lesson plan lists resources, labs, and student work to be used in each lesson.
- Lab activities are also integrated into each chapter. In the lab instructions, teacher lab directions provide a list of equipment and materials for each lab and investigation. Student materials include an equipment list for each lab and investigation. For example, Chapter 12, Section 1 lists that teachers will need the PowerPoint presentation, SPARKvue software, pressure sensor, and a specified interactive simulation.

PASCO SCIENTIFIC Essential Chemistry

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

- Lab safety procedures are provided for both student-facing and teacher-facing materials. For each unique lab, there are detailed instructions and pictures for setup and use of required materials and procedures. Instructions that fall under “General Safety Precautions and Procedures” are not explicitly listed in each lab, but each lab activity references this list in the Safety chapter.
- Teacher Lab Directions documents are provided. These reflect the same safety guidance the student-facing documents provide for each lab. The teacher edition also contains a Laboratory Safety Procedures document, slide show, and student quiz, beginning on page xii.
- Lab instructions include “Student Lab Directives” for each lab under the heading of Safety, which includes unique safety precautions and personal protective equipment for that unique lab activity. The student materials also include pictures of proper equipment setup and procedures on how to use the equipment.
- Although guidance is present for safe practices in every lab, some only state, "Follow regular lab safety procedures." Within the table of contents of the lab book, the description of these “General Safety Procedures and Precautions” can be found on page xii. Guidance for the use of safety equipment is not provided beyond that of a fire extinguisher.

PASCO SCIENTIFIC Essential 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.	DNM
2	Materials guide strategic implementation without disrupting the sequence of content that must be taught in a specific order following a developmental progression.	PM
3	Materials designated for the course are flexible and can be completed in one school year.	DNM

Partial Meets | Score 1/2

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

Materials do not support scheduling considerations and include guidance and recommendations on required time for lessons and activities. Materials guide some 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 not flexible and can not 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 do not provide support for scheduling considerations. There are no pacing suggestions within the lesson plans for each unit.
- In the teacher edition, each lesson plan includes a summary showing learning objectives, prior knowledge requirements, and all associated resources, including investigations and assessments. Times or pacing suggestions within lesson plans are not included.

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

- The table of contents sequences chapters to ensure precursor concepts are taught first. Lesson plans provide some guidance for strategic implementation through the presentation slides, whole group discussions, and investigations, but there is no evidence of sequencing guidance beyond the order in which the chapters are presented. Additionally, the table of contents does not support TEKS alignment.
- Precursor concepts are sequenced appropriately based on the chapter they are in. For example, Chapter 6 covers moles, followed by Chapter 8, which covers Stoichiometry. For another example, in Lesson 10.1, Chemical Bonds, Lesson 1 discusses bonding in a general sense, and Lesson 2 discusses specific types of bonds.
- Lesson plans guide strategic implementation by including whole group discussions, investigations, and slide presentations. However, there is no guidance for the sequencing beyond the order the contents are presented for each unit.

PASCO SCIENTIFIC Essential Chemistry

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

- There is flexibility in the materials evident in editable resources found in the “Lesson Plans,” allowing teachers flexibility to edit lessons, activities, and assessments based on local time constraints and needs. There is no guidance for teachers to make these adjustments. The materials do not indicate if the resource will cover an entire year of content, but all Chemistry TEKS are addressed. There is no evidence of implementation guidance to assist teachers in pacing the material to cover a full school year. There are additional chapters at the end of the resource in case teachers find themselves ahead and require more material.
- The materials cover a full year’s TEKS. Extra chapters are also provided at the end of the resource to allow for additional content to be taught should there be time left in the school year. However, no pacing guide is provided on how to make adjustments for local schedule differences. The materials do not indicate if all the chapters can be covered in one school year. The program has no implementation guidance for how to prioritize the lesson materials if needed.
- Flexibility is also evident in multiple options within lessons. For example, in Lesson 10.1, Chemical Bonds, student assignments include a vocabulary crossword, a vocabulary fill-in-the-blank, and an interactive simulation. There are no times given, but this demonstrates having multiple options available.

PASCO SCIENTIFIC Essential 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.	No

Not Scored

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

Materials include an appropriate amount of white space and a design that supports and does not distract from student learning. Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. Materials include some digital components that are 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 include an appropriate amount of white space and a design that supports and does not distract from student learning. For example,
    - The margins, edges, and empty spaces are consistent throughout the book sections, with similar spacing between subsections and paragraphs. The materials include two fonts, one for the body of the text and another for the headings, and strategically use colored fonts to assist the reader in navigating the content
    - Both the digital and paper versions of the investigations feature similar formatting, with orange-colored section headings such as Inquiry, Materials, Background, Safety, Analysis, and Questions. Both versions include an appropriate amount of white space that supports student learning.
    - Margins contain white space, and there is a buffer between paragraphs and around images. The titles are in the left margin, with content indented next to each title. For example, Chapter 3: Classifying Matter, Section 1: Atoms and the Periodic Table includes the heading “The question of scale” and features titles such as “The concept of scale,” “The description of the macroscopic scale,” and “The description of the microscopic scale of atoms” in the left margin, with the accompanying content indented next to each title.

PASCO SCIENTIFIC Essential Chemistry

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

- The materials provide age-appropriate visuals and graphics that support learning without being visually distracting. For example:
    - Chapter 4: Temperature and Heat, Section 2: Thermal Energy and Heat includes a picture of a person in a swimming suit standing on ice next to a hole in the ice. Next to the picture, there is a diagram with labels showing the flow of heat from the person to the ice and surrounding air.
    - Chapter 16, Acids and Bases, Section 1: Acids and Bases includes a rainbow-colored pH scale with red at a pH of 0 (labeled most acidic) and purple at a pH of 14 (labeled most basic). Along the scale from 0 to 14 are small titles and pictures representing everyday household items found at each pH level, such as lemon at pH 2 and bleach at pH 12.
    - Investigation 7B- Chemical Reactions includes pictures of the materials that students will use to complete the lab investigations, such as a bunsen burner, a test tube holder, and a graduated cylinder.

Materials include digital components that are free of technical errors.

- The materials included in the digital components are mostly free of technical errors.
    - The materials are mostly free from grammatical and spelling errors. For example, Chapter 3: Classifying Matter, Section 1: Atoms and the Periodic Table states, “To explain the diversity of matter we need the concept of scale. In this context, scale means a typical ‘size’ of detail for a measurement. Consider the three photographs of snow on the right. On a scale of ten meters snow, looks smooth and featureless. But the closer you zoom in, the more detail you see.” The comma after snow is located in the wrong place.
    - The materials are mostly free of inaccurate content materials or information. When viewing some test questions online, the formatting for equations causes them to stack upon one another, making the variable indistinguishable. Some images for the tests and quizzes are unclear even when zooming in on the image.
    - The Search icon allows students to search for a term and will curate a list of references to that term with a hyperlink to its location in the online text. This feature is limited in its ability to find words within the text. For example, a search for stoichiometry or subscript does not yield any results from the search. A search for gas laws produces sixteen results.
    - The materials are free of wrong answer sheets to problems. For example, Chapter 4: Temperature and Heat, Section 3: Heart and Changes of State includes a Phase Changes worksheet that asks the question, “Under normal conditions on Earth, what must change for water to undergo a phase change?” and provides the answer “Enough energy must either be lost or gained, otherwise, water will just stay in the same phase and only change its temperature.”

PASCO SCIENTIFIC Essential Chemistry

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.	No
4	Materials integrate digital technology that is compatible with a variety of learning management systems.	Yes

Not Scored

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

Materials integrate digital technology and tools that support student learning and engagement. Materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific content. Materials do not integrate digital technology that provides opportunities for teachers and/or students to collaborate. Materials integrate digital technology that is compatible with a variety of learning management systems.

Evidence includes but is not limited to:

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

- The materials integrate digital technology and tools that support student learning and engagement. For example:
    - The materials include Interactive Simulations in lessons, allowing students to visualize the abstract. For instance, Chapter 3: Classifying Matter, Section 1: Atoms and the Periodic Table includes the Cubic Zirconia interactive simulation that allows students to interact with a model of the Cubic Zirconia molecule. Chapter 15: Equilibrium, Section 1: Chemical Equilibrium includes a Nitrogen dioxide simulation that allows students to visualize molecules associated with smog.
    - Each section of the materials ends with an invitation for students to Take A Quiz, which directs students to a self-grading online quiz. After selecting the answers to five multiple-choice questions, students can select buttons that will score the quiz, provide hints on incorrect responses, try again, print the quiz, or show the correct answers with detailed calculations as applicable. In addition, a new quiz with random questions can be selected as often as desired by the student.
    - Student digital components include text-to-speech and glossary tools. The Essential Chemistry User's Guide states, "All the main body paragraphs in the Essential Chemistry student e-Book have been narrated and will read aloud when the speaker button is clicked." Glossary words appear in bold blue type. Clicking glossary words opens the

definition in a floating window, and definitions can be toggled between English and Spanish.
    - The materials include an Interactive Equation Builder that allows students to enter unbalanced equations and balance the reaction. The Essential Chemistry User's Guide states, "The interactive equations are designed to show how adding or removing a substance affects the amounts of products or reactants depend on a balanced reaction."

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

- The materials integrate digital technology in ways that support student engagement with the science and engineering practices and course-specific content. For example,
    - The materials provide a student assignment to accompany the Boiling Point: Polar and Nonpolar simulation in Chapter 11: Energy and Change, Section 1: Energy and Changes of State. The assignment begins with a driving question "How does the shape of a substance impact its boiling point?" Next, the materials direct students to describe the differences between the polar and nonpolar molecules shown in the simulation, run the simulation for the two types of substances at three temperature ranges, record observations in a table, analyze the observations, and then provide an answer to the driving question.
    - The materials include Test Your Knowledge questions that allow students to answer the question and then reveal the answer to check their work. Chapter 15: Equilibrium, Section 2: The Equilibrium Expression includes a Test Your Knowledge question that asks, "What is the biggest difference between the procedure for writing an equilibrium expression compared to the procedure for writing a rate law expression?" Students can click show solution and see the answer "When writing an equilibrium expression, the concentration of each substance is raised to a power equal to the coefficient in the balanced equation. When writing a rate law, the exponents are the orders of the reaction and are not always equal to the reaction coefficients."
    - The materials integrate SPARKvue software into some of the lab investigations. The Essential Chemistry User's Guide states, "Some of the hands-on investigations in Essential Chemistry use the award-winning data collection software SPARKvue from PASCO. Students use this software for data collection, visualization, and analysis in conjunction with PASCO's wireless Temperature, pH, Conductivity, Colorimeter and Turbidimeter, Pressure, and Voltage sensors. SPARKvue provides a sensor-based data collection environment that is intuitive enough to use with young learners, yet powerful enough for advanced applications."
        - Lab 4D - Heat of Fusion requires using the temperature sensor and a device with SPARKvue software. After opening the SPARKvue software on their device and connecting the temperature sensor via Bluetooth, the procedures state, "Start collecting data and measure the temperature of the hot water. Record the temperature in Table 1. Keep the temperature sensor in the hot water."

PASCO SCIENTIFIC Essential Chemistry

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

- The materials do not integrate digital technology that provides opportunities for teachers and/or students to collaborate. For example:
    - The materials allow teachers to save "a copy of the Google Slides version of assignments to distribute via Google Classroom." While Google Classroom is a web app that facilitates collaboration, the materials do not provide their own online digital platform to allow teachers to collaborate with students via video conferencing, virtual tutoring, or posting video tutorials.
    - Some of the lab investigations, such as 11C-Hess's Law, invite students to compare data through prompts in post-lab questions such as "How do your heats of reaction for Trials 1 and 2 compare to those of other groups?" However, the materials do not provide a digital forum for students to post information about their learning during lab investigations to collaborate with other students.
    - Lab 5A - Patterns and Trends allows students to collaborate face-to-face by “using known properties of elements” to reconstruct the periodic table. While this activity allows students to collaborate, it does not integrate digital technology to do so.

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

- The digital materials are accessible and compatible with multiple operating systems and devices. For example:
    - The materials are accessible and compatible with Chromebooks, iPads, PCs, Apple computers, and/or smartphones. The Essential Chemistry User’s Guide states, “The Essential Chemistry e-Book may be used online on any device such as computers, tablets, and smartphones.”
    - The materials are accessible online through any device with internet access. The materials can be accessed through any web browser by entering an access code that is “shared by all students.”
    - The materials are downloadable and accessible without access to the internet. The materials come as both a “hardcover textbook and online e-Book with coordinated lab equipment.” Assignments, notes, presentations, and answer keys all come in PDF format that can be downloaded and accessed without the Internet.

PASCO SCIENTIFIC Essential Chemistry

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.	No

Not Scored

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

Digital technology and online components are developmentally appropriate for the course and align with the scope and approach to science knowledge and skills progression. Materials provide teacher guidance for the use of embedded technology to support and enhance student learning. Materials are not 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. For example,
    - The Chapter 16 Section 2: The pH Scale lesson plan states, "The student will be able to: 1. use the pH scale to determine whether a substance is an acid or a base, and 2. calculate pH and pOH using the logarithmic formula." The online self-grading quiz for Section 16.2 has questions that align with these objectives and are developmentally appropriate, such as "The pOH of a solution is 12. Calculate the pH and classify the solution as acidic, basic, or neutral." and "What is the concentration of H+ in a solution that has a pH of 6.34?"
    - The materials include a Chemistry Equation Builder that connects with interactive simulations embedded in the lessons. For example, the Essential Chemistry User's Guide states, "When the Interactive Simulation icon appears in the left margin next to a solved problem in the e-Book, it will evoke the relevant chemical equation in the equation builder." Students can also create their own equations and solve them using the equation builder.
    - The materials include interactive simulations that allow students to visualize abstract concepts. Chapter 4: Temperature and Heat, Section 1: Temperature includes the "Interactive Simulation: Brownian Motion Simulation" that simulates the movement of

particles at different temperatures and traces the random movement of a specific particle.

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,
  - The Essential Chemistry User's Guide states, "Many content pages of the e-Book have a question at the bottom of the page so students can check their understanding of the material on that page." For instance, Chapter 9: Atomic Structure, Section 1: Atoms Have Structure includes a Test Your Knowledge question that asks, "What is the atomic number of Molybdenum-96?" Students can answer independently and then reveal the answer to check their understanding.
  - The Essential Chemistry User's Guide guides the teacher through using interactive simulations by stating, "An icon in the margin identifies many places throughout the e-Book where relevant, interactive simulations, equations, or molecules are found, including solved problems. You can also retrieve all interactives within a chapter by clicking the 'Interactives' icon in the navigation bar at the top of the screen."
  - The Chapter 19 Section 3: Nuclear Energy lesson plan lists the Interactive Simulation: Control Rod Simulation under the Electronic Resources heading. The materials include a slide presentation indicating when to include this simulation in the lesson after delivering content-specific information about fission, nuclear energy, and nuclear reactors and before discussing nuclear fusion. The specific slide in the presentation shows a picture of the simulation and states, "The Control Rod Simulation allows you to control the fission rate by raising and lowering the control rods. Try to keep the heat output in the green range."

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

- The materials do not include resources for parents and caregivers on how to support student engagement with digital technology and online components. For example:
  - The Essential Chemistry User's Guide includes a Quick Guide Videos section with links to three videos. One video is titled Quick Guide: Navigating the Student e-Book. This video is designed for teachers and students, not parents and caregivers.
  - The materials do not include a section specifically for families with links to information about science objectives, at-home extensions, related inquiry projects, and websites for student research. They do include a support section on the product website that says, "Our Technical Support Staff is ready to answer your questions or walk you through any issues using our products."
  - The materials include a student e-book that can be accessed from anywhere. However, there is no specific guide for parents on supporting student engagement with this e-book or resources for supporting student engagement in the materials.