Summit K12 Dynamic Chemistry

Summit K12 Dynamic 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 designed to strategically and systematically integrate scientific and engineering practices, recurring themes and concepts, and grade-level content as outlined in the TEKS.
- The materials anchor the learning in phenomena and problems as the key lever for driving learning and student mastery of disciplinary knowledge and skills.

Section 3. Knowledge Coherence
- The materials are designed to build knowledge systematically, coherently, and accurately.
- The materials provide educative components to support teachers' content and coherence knowledge.

Section 4. Productive Struggle
- The materials provide opportunities for students to engage in productive struggle through sensemaking that involves reading, writing, thinking, and acting as scientists and engineers.

Section 5. Evidence-Based Reasoning and Communicating
- The materials promote students' use of evidence to develop, communicate, and evaluate explanations and solutions.
- The materials provide teacher guidance to support student reasoning and communication skills.

Section 6. Progress Monitoring
- The materials include a variety of TEKS-aligned and developmentally appropriate assessment tools.
- The materials include guidance that explains how to analyze and respond to data from assessment tools.
- The assessments are clear and easy to understand.

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Section 7. Supports for All Learners

- The materials provide guidance on fostering connections between home and school.
- The materials include listening, reading, writing, and speaking supports to help Emergent Bilinguals meet grade-level science content expectations.
- The materials include a variety of research-based instructional methods that appeal to a variety of learning interests and needs.
- The materials include guidance, scaffolds, supports, and extensions that maximize student learning potential.

Section 8. Implementation Supports

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

Section 9. Design Features

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

Section 10. Additional Information

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

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Indicator 2.1

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

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

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials are designed to strategically and systematically integrate scientific and engineering practices and course-level content as outlined in the TEKS.

Materials provide multiple opportunities to develop, practice, and demonstrate scientific and engineering practices as outlined in the TEKS. Materials strategically and systematically develop students' content knowledge and skills for chemistry as outlined by the TEKS. Materials include sufficient opportunities for students to ask questions, plan, and conduct laboratory investigations or problem-solve to develop an understanding of science concepts.

Evidence includes but is not limited to:

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

- The materials provide multiple opportunities for students to develop appropriate scientific and engineering practices through discussions, analysis, and planning. For example, in Unit 1 of Lesson 1.3, students design a measuring device to determine the furniture's dimensions as precisely as possible. The students go on to develop and evaluate a prototype. In this one activity, students have the opportunity to develop the following scientific and engineering practices: [SEP C.1A] Define Problems,[SEP C.1B] Use Engineering Practices to Design Solutions to Problems,[SEP C.2D] Evaluate Engineering Designs, and [SEP C.4A] Analyze and Evaluate Solutions. Materials provide multiple opportunities to practice appropriate scientific and engineering practices outlined in the TEKS. For example, in Unit 3, Lesson 3.1, "Development of the Periodic Table and Properties of Families," students develop a model of the periodic table with limited and missing information and then write advantages and limitations based on the model they construct. Students reflect and ask questions using evidence on the model created.
- The scientific and engineering practices (SEPs) document in the "Teacher Resources" lists the different SEPs, their location, and how to implement them. This document also includes which scientific and engineering practices are covered and demonstrates where each lesson gives students the opportunity to practice them.

- Another example in the material showing an opportunity to practice scientific and engineering practices is in Unit 8.1, which focuses on TEKS C.13A. In the engineering project of this unit, which focuses on the four laws of thermodynamics, students design, test, and evaluate a temperature-controlled container. Teachers provide guided questions, materials, and their costs. Students discuss, present, build, and test their ideas using the information provided. Students are given the opportunity to provide feedback with guided questions.
- The materials include lesson guides that provide teacher guidance on how students will demonstrate mastery of the scientific and engineering practices through different measures such as discussions and group evaluation of data collected from their labs and lesson activity. For example, the "Periodic Table Reasoning" activity in Chapter 3 of Lesson 1 and the "Popcorn and Water Models of Phase Changes" from Chapter 7 of Lesson 1 ask the students to show mastery by evaluating their results and possible errors. An example includes the lesson guide for 6.1, which connects the science and engineering practice to the literacy connection activity.

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 for chemistry as outlined in the TEKS. Course-level content is built upon for the students to continue using throughout the school year in different lessons, activities, and investigations. For example, in Unit 1, students start with choosing the proper tools in the chemistry lab to collect and analyze data for accuracy. Students then begin to learn how to use significant figures in scientific measurements. In Lesson 1.3, the "Investigative Measurement Stations" lab, students use basic lab equipment to practice writing and recording data in tables while using significant figures. Later students are responsible for using significant figures while calculating pH in Unit 10. Skills learned early in the year are logically scaffolded in the materials and activities, introducing concepts students will continue using throughout the year. For example, in Chapter 1, students learn about lab safety protocols, including the "Globally Harmonized System" of classifying chemicals (GHS), which they continue to use throughout the year to practice other scientific and engineering practices safely.
- The lesson guide provides activities that develop students' content knowledge and skills strategically and systematically. Content mastery, science literacy, chemistry interactives, videos, and teacher resources provide a vertically-aligned scaffolded lesson. For example, three scaffolded lessons in Unit 8.1 are the "Patterns of Thermal Energy," "Gravitational, Elastic, and Chemical Potential Energies," and "Energy Transfers and Transformations." These lessons include prior knowledge connected to the current content in the unit about the laws of thermodynamics. The overview for Unit 7 also shows how the content knowledge is strategically laid out for students to scaffold their learning. It shows students connecting kinetic molecular theory to the relationship of gasses.
- Materials include lesson guides, teacher notes, vertical alignments, and answer keys that support teachers in guiding students. The lesson guide also provides each activity's TEKS and SEP standards. Materials also group topics that have recurring themes and concepts together with an increase in the complexity of knowledge and skills. For example, Unit 8 starts with the conceptual study of the Laws of Thermodynamics. Students apply those concepts to differentiate between endothermic and exothermic reactions. The materials include guidance on helping students investigate and calculate heat transfer in the reactions.
- The materials support teachers in developing student content concepts and skills by giving them resources and cues at varying points in lessons and units throughout the grade level to increase

the teacher's effectiveness. For example, in Unit 1 of Lesson 1.3, the engage activity includes directions for teachers that state, “Students will respond to the following question by writing for one minute and then sharing with a partner. Guide students in a brief discussion based on their answers. What standard lab equipment have you used in the past, and what did you use them to do?” The material explains how to guide students in the lesson to connect with the content in the activity with other 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 to engage in problem-solving to develop an understanding of science concepts.

- Materials include sufficient opportunities, as outlined in the TEKS, for students to conduct investigations to develop an understanding of science concepts. For example, in Unit 3 of Lesson 3.2, students graph data for various periodic trends and conclude their observations over periodic trends. There are many labs within the materials that provide students with opportunities to practice scientific and engineering practices. For example, the 3.1, 5.1, 7.2, 8.1, and 8.2 chapter lessons all have an activity that allows students to ask questions.
- As seen in lesson guide 7.2 over relationships between gas variables, students are also allowed to ask questions and conduct an investigation in the classroom while virtually exploring the variables that affect gas behaviors.
- Materials provide opportunities for students to collaborate, ask questions, plan investigations, and problem-solving throughout the chapters, units, and lessons. For example, in Unit 2 of Lesson 2.4, students investigate electrons by using a die to model transmission between the excited- and ground-state electrons in a hydrogen atom when energy is absorbed and released. This activity allows the students to collaborate with their peers to use their observations to connect them to the lesson's concepts by problem-solving and creating models. In Lesson 7.2, which covers relationships between gas variables, students can also ask questions and investigate in the classroom while virtually exploring the variables that affect gas behaviors.
- Materials include classroom investigations that allow students to have a deeper understanding of the science content connected to the TEKS. For example, in Unit 6, students can ask questions and conduct investigations, as seen in the “Law of Conservation of Mass Investigation.” This document asks students to conduct a classroom investigation to help develop an understanding of the science content. The labs in 7.6 (Aqueous Solutions Lab), 6.6 (Product Development Project), and 4.1 (Be the Example) are all examples from the material that allow students to plan their procedures to carry out investigations. Having students strategically plan out their procedures, ask questions and conduct laboratory investigations are opportunities for students to problem-solve.

Indicator 2.2

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

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

Meets | Score 4/4

The materials meet the criteria for this indicator. Materials anchor the learning in phenomena and problems as the key lever for driving learning and student mastery of disciplinary knowledge and skills.

Materials embed phenomena and problems across lessons to support students in constructing, building, and developing knowledge through the application and performance of scientific and engineering practices outlined in the TEKS. Materials provide opportunities for students to connect with their prior knowledge in multiple lessons, activities, and units relating to phenomena and engineering problems. Materials clearly outline for the teacher the scientific concepts and goals behind each phenomenon and engineering problem.

Evidence includes but is not limited to:

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

- Materials embed problems across lessons to support students in building and developing knowledge through authentic application and performance of Scientific and Engineering Practices (SEPs) and course-level content as outlined in the TEKS. For example, in Unit 3, Lesson 6.6, students test elements and objects for conductivity, ductility, malleability, and luster properties. Students select an everyday object, research its materials, and connect the material's properties to its function within the object, all of which are aligned to SEP 6.4B and 6.1B. Another example includes students learning about accuracy and precision, measurements, and tools at the beginning of Unit 1 and practicing these skills to help them learn about significant figures so they can apply that to the dimensional analysis process in the last unit lesson. Another example of how lesson activities support the authentic application of science and engineering practices is in the Apply and Extend section of Unit Lesson 8.3; students can choose between three investigations that connect to real-world scenarios such as Calorimetry Specific Heat Virtual Lab, Enthalpy of Formation of MgO Using Calorimetry and Hess' Law Investigation, and Heat of Fusion of Ice Investigation. In all three investigations, students construct their knowledge by collecting and analyzing data. They build and develop their mathematical skills to calculate the formation of enthalpy and fusion heat.

- The materials use real-life connections to phenomena and problems to support students in constructing, building, and developing knowledge. For example, at the beginning of each lesson guide lesson, there is an “Establish Relevance” section in which students discuss a phenomenon to see how the content relates to them. The students then use the skills previewed in the Establish Relevance section. Additionally, labs use phenomena as the basis for the investigation centers. For example, in Chapter 4, Lesson 2 begins with a rhyme students can relate to about the importance of understanding chemical naming and formulas. The final activity in the lesson guide has students investigate the formation of precipitates using their skills in naming and writing ionic formulas. The materials also embed phenomena to support students in developing knowledge by establishing experiences to which students can relate that knowledge. For example, in Chapter 5, Lesson 1, the teacher demonstrates miscible and immiscible solutions. The teacher uses this demonstration as common ground for all students to ask questions about the concept, such as why ionic and covalent compounds have different characteristics. Additionally, before studying calorimetry, students observe nutrition labels and make connections to calorimetry. This activity also provides Establish Relevance to give students a general idea about specific heat capacity with the example of the temperature of a pool in summer.

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

- Materials provide opportunities for students to connect with their prior knowledge in multiple lessons, activities, and units related to engineering problems. For example, in Unit 4, students use previous knowledge of the periodic table of elements and compounds in the engineering problem “Chemical Plant Chaos!” to complete labels with chemical formulas. The materials use previous experiments or knowledge to increase engagement in the Engage segment of each lesson guide. For example, in Unit 2, Section 8.6b, students are asked about fireworks to connect to their prior knowledge and experiences. In lesson guide 6.2, the abstract concept of the mole is made more relevant by relating it to buying eggs. Connecting the concept of the mole to something relatable allows students to understand the rest of the investigation within the unit.
- The materials also accommodate different entry points to learning and solving problems through various means, such as teacher demonstrations, hands-on experiences, videos, data, and images. For example, the units in the teacher resources are accompanied by videos and interactive activities. In Unit 2, Lesson 2.2, students observe and record masses of individual and multiple items to understand the difference between an average and a weighted average in a teacher demonstration. Another example where the material accommodates different entry points to learning and solving problems is shown in Unit 9.2, to learning about precipitate reactions. Teachers provide options for student choice in their learning, such as “Reactions Reading and Practice” to improve theoretical and mathematical knowledge or “Virtual Lab Precipitation” to analyze solubility rules.
- In Unit 7, “Behavior of Gasses,” a link is provided in a lesson guide that connects to TEK 6.6A. Students begin with exploring a phenomenon that is a part of their everyday life about scents traveling through the air. The material explains that “Students will investigate how long it takes for an unknown substance's scent to reach them and fill the classroom.” This activity encourages discussions using student observations and data collected to connect to the content.

- Each unit includes a vertical-aligned scaffold lesson to review previously taught knowledge. Also, in the handout of each investigation, there is a background section reviewing prior knowledge. For example, Unit Lesson 9.2 shares recurring themes about ions. In the background section of Precipitation Reactions, materials guide teachers to connect and make explanations that rely on prior knowledge about ion and ionic bonding in Unit 4.1 before giving a lesson about precipitate reactions.

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

- Materials clearly outline for the teacher the scientific concepts and goals behind each engineering problem in the lesson guide. For example, in Unit 1, Lesson 1.3, in the Engineering Design Project, the materials list that scientific and engineering problem [SEP C.1A] Define Problems, [SEP C.1B] Use Engineering Practices To Design Solutions, [SEP C.2D] Evaluate Engineering Designs are behind this activity and tied to it. Additionally, in the activity "Literacy Connect: using subscripts to make ionic compounds" from Unit 4, Lesson 2, the activity's goals—that students learn the meaning of subscripts—are written below the instructions.
- The materials identify student learning goals that connect to each phenomenon or scientific concept in the chapters, lessons, and activities. There is clear teacher guidance in the lesson guides, which guide the goals of the phenomena where students are asked questions to relate their understanding of the concept to the new idea. For example, height to moles in "The Math of Chemistry" lesson guide guides for teachers to identify the goals behind each phenomenon. Furthermore, in the EBK Teacher's edition, checkpoints throughout the chapter outline the targeted goals of student achievement regarding the phenomena studied. For example, the checkpoint box asks, "Why must a chemical equation be balanced?"
- Another example includes the "Comparing Acidity/ Basicity of Household Items Investigation" in Unit 10.1. This investigation mentions using pH values to determine whether one household item is an acid or base. This practice allows students to relate the main scientific concept of the determination of pH to the learning goal in the lesson guide.
- TEKs are described at the beginning of each lesson guide, and each practice has learning objectives. Also, the Scope and Sequence provide the TEKs related to each unit. For example, in Unit 10.1, the learning objective of the Comparing Acidity/Basicity of Household Items Investigation is to determine whether a substance is an acid or base according to its properties. This investigation also provides the SEP standards.

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Indicator 3.1

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

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

Meets | Score 6/6

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

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

Evidence includes but is not limited to:

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

- The materials connect new knowledge and skill learning goals to previous and future goals within and across units and grade levels. It is important to integrate student understanding from middle school to scaffold students to the level of thinking to comprehend how atoms interact to form new compounds in chemical reactions. For example, in Unit 2, Atomic Structure, in the lesson guide under Teach and Discuss, the materials state, "In 6th grade, students identified elements on the periodic table as metals, nonmetals, metalloids, and rare Earth elements based on their physical properties and importance to modern life. In 7th grade, students used the periodic table to identify the atoms and the number of each kind within a chemical formula. In high school chemistry and IPC, students will continue the study of chemical reactions." Also, in Unit 4, Lesson 1, the objective is for students to compare and contrast elements in terms of atoms and molecules. The lesson guide demonstrates how concepts evolve from students identifying elements (sixth grade) to classifying substances (eighth grade) to developing an understanding of elemental accounting in chemical compounds and reactions. Students continue to develop this concept and eventually use it to complete stoichiometric calculations and percent composition calculations later in the year. Finally, in Unit 9.1, in the Teach and Discuss section, the lesson guide demonstrates how new knowledge will be connected to and extend the learning from eighth grade about the behavior of water. In the lesson guide of Unit 9.1, teachers using Vertical Alignment know that students learn about the properties of cohesion, adhesion, and surface tension of water in eighth grade. This information helps teachers to integrate the student's understanding of the behavior of water into the current lesson on Solutions.

- The materials are designed with opportunities for students to build and connect their knowledge which is evident by the differentiation, scaffolding, and accelerated instruction in each unit. The scaffolding support with vertical alignment is in the teacher resource guide under each unit, identified by a special icon. For example, in Unit 7, a section is identified with an icon labeled 6.6A, Compare Solids, Liquids, and Gases, which brings up a lesson guide to help support students to scaffold their learning from the fifth, sixth, and seventh grades. All of the lesson objectives from this differentiation piece support the current unit of chemistry, the Behavior of Gases. These scaffolding lesson guides provide teacher support with questions, activities, and a 5E lesson plan to tie into the current content.

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 to abstract reasoning when presenting concepts that allow for increasingly deeper conceptual understanding. For example, in Chapter 3, Periodic Table, Lesson 3.1, the materials start with the teacher asking students to think of things that have periodic properties, such as days of the week, months of the year, seasons, and the chorus of a song. “What do these things have in common? How can they be used to make predictions?” Then it progresses into the Development of the Periodic Table reasoning activity, where students replicate this process and construct a periodic table of representative elements by analyzing data on element cards and predicting the properties of the “missing” elements. Finally, students analyze and evaluate an article on recycling rare earth metals to develop their own questions and define problems with the current need for rare earth elements in technology. In Unit 6, Lesson 3, students begin by conducting an investigation demonstrating the law of conservation of mass, whereby they collect concrete evidence by measuring the mass of the reactants and products. Students then build on this concept by completing the representational lab, Mass Conservation Basics, where they model balancing chemical equations. Finally, students use more abstract thinking to balance chemical equations using mathematical reasoning. This knowledge is then applied to moles, molar mass, and stoichiometric calculations.
- Materials sequence instruction in a way that reviews prior knowledge before introducing new concepts. The lesson guide always starts with an investigation or phenomenon to activate the previously taught lesson. This method helps students increase their conceptual understanding. For example, according to the lesson guide of Unit 8.2, teachers provide “Bubbles Galore—An Exploration of Exothermic Reactions Investigation” to engage students in the new concepts of energy changes in chemical reactions. Teachers suggest students use the knowledge in sixth grade about the evidence of chemical change. In the next section, teachers introduce the theoretical concepts using the Endothermic and Exothermic Reaction and Reading Guide. To help students gain a deeper conceptual understanding, teachers provide stoichiometry practices such as Calorimetry Heat of Solution Virtual Lab or Energy Changes When Melting Ice Investigation to show the evidence in mathematical calculation.

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

- The materials clearly present grade-specific core concepts and science and engineering practices. The planning guide acts as a roadmap for teachers to follow. Each segment or activity contains a quick summary as well as suggested questions and key concepts that students should get from that activity. For example, Chapter 5 begins with an “Engage” demonstration in which students observe the miscibility of different substances. The segment tells teachers to ask the students, “Why do you think the sugar dissolves in the water, but, in the oil, it does not if they are both covalent compounds.” This question triggers students to ask questions based on observations from phenomena (SEP C1.A).
- Each segment contains these pointers for the teacher and lists the SEPs that are covered underneath the activity. For example, in Chapter 3, Lesson 3.2 in the Engage section, students refer back to the periodic table and predict a characteristic of a new element, #120. In the Explore section, students analyze data to identify periodic trends. In the Explain section, students learn about the different trends of the periodic table. For Elaborate, students use their knowledge and graph the trends they have learned, and finally, for Evaluate, students are assessed over the unit.
- Additionally, in the Unit 7.1 Lesson Guide, the core concepts are clearly labeled at the top (10AC), and the SEPs, as well as core-specific vertical alignment TEKS, are listed. Beneath the section labeled Investigation: Popcorn and Water Models of Phase Changes, the SEPs are listed (SEP C.1G and SEP C.2A). Also, there is a section beneath that labeled Vertical Alignment with the TEKs listed as well as a detailed explanation of what students have learned before. The Kinetic Molecular Theory is clearly presented, which is specifically to be covered as listed in the core-specific TEKS.

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

- Mastery requirements of the materials are within the boundaries of the course's main concepts. For example, in Chapter 2, Lesson 2.3, the vertical alignment materials indicate that students have described the nature of the four fundamental forces (IPC.5D) and researched nuclear reactions in current technologies (IPC.8C) in IPC. This structure provides a background in chemistry. When studying nuclear chemistry, students are expected to be able to explain nuclear reactions like fission and fusion and what a nuclear force is. The materials direct teachers to have students write down as many real-world uses of nuclear power and radiation as possible and compare and contrast fission and fusion and balance nuclear equations.
- Each lesson guide lists the TEKS at the top of the page. For example, in Unit 6, Lesson 1, the TEKS, C.8c, and C.8D are listed and described at the top. Additionally, activities usually have notes on the objective of the activity. For example, in Unit 6, Lesson 1, under the “Literacy Connection - Differentiating Between Empirical and Molecular Formulas,” the assignment's goal is summarized: “Students will complete the activity to introduce them to empirical and molecular formulas and then practice differentiating between them.”
- Materials provide mastery checks within each lesson guide which identify the mastery requirements of that lesson. For example, in Lesson guide 7.2, at the end of the document, links to activities and assessments indicate to teachers whether students mastered the material throughout each lesson stage. These assessments are within the boundaries of the course's main concepts because they fall within the scope and sequence of the TEKS.

- The materials provide teachers with a comprehensive and concise lesson guide that includes specific core concepts and SEP (Science and Engineering Practices) standards. Each lesson guide concludes with a detailed description of the SEPs incorporated into the activities. All activities within the lesson guides accurately present the SEP standards. For instance, at the beginning of Lesson Guide 9.3, students get guidance from teachers to use terms such as solute, solvent, and solution to describe their observations of a series of flasks containing different concentrations of colored water solutions. Furthermore, students apply formulas to calculate molarity in the Molarity and Dilution Lab. This lab incorporates three specific SEP standards: [SEP C.1D] Use Appropriate Tools, [SEP C.2B] Analyze Data by Identifying the Source of Error, and [SEP C.2C] Use Mathematical Calculations. After acquiring the necessary knowledge and skills, the materials intentionally provide an engineering project called "Potable Water Problems." In this project, students develop a water filter capable of removing visible sediment, reducing dissolved ions, and balancing the pH of a water sample. By engaging in this project, students have the opportunity to acquire new skills that align with the SEP standards, including [SEP C.2Dii] Collecting quantitative data, [SEP C.1Aii] Defining problems based on observations, and [SEP C.Bvii] Using engineering practices to design solutions to problems.

Indicator 3.2

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

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

Meets | Score 6/6

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

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

Evidence includes but is not limited to:

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

- Materials include guidance that supports teachers in understanding the vertical alignment of course-appropriate prior knowledge and skills. For example, in Unit 2, Lesson 2.1, History of the Model of the Atom, under Teach and Discuss, there is a vertical alignment section that states, "In the 8th grade, students use the periodic table to identify atoms involved in chemical reactions (8.6B)." Throughout units in the materials, there is also an icon just for scaffolding vertical alignment lessons. For example, in Unit 2, the scaffolding icon appears for a lesson from an IPC TEK 5.D, which is vertically aligned and has students "Describe the nature of the four fundamental forces: gravitation; electromagnetic; the strong and weak nuclear forces, including fission and fusion; and mass-energy equivalency." In Lesson Guide 6.1, the guidance explains to the teacher what students should have mastered in previous grades, and this knowledge can be built on throughout the lesson. For example, Lesson 6.1 explains that in seventh grade, students should have understood temperature and kinetic energy relationships.
- The instructional materials incorporate vertically aligned scaffolds with corresponding TEKS numbers. These scaffolding lessons help teachers to integrate prior knowledge with current concepts. For example, in Unit 9, students can revisit the Behavior of Water lesson before delving into the content and practices for Solutions. In the "Teach and Discuss" section of the Unit 9.1 lesson guide, the vertical alignment indicates that students should describe the

properties of cohesion, adhesion, and surface tension in water (8.6C). By utilizing the lesson on the Behavior of Water (8.6C), teachers can facilitate a review of students' previous knowledge and skills before engaging in the core discussions of Unit 9.1. Additionally, in the scaffolding Lesson 8.6, teachers can provide either the Exploring Water's Behavior Inquiry Lab or assign a Water Property Phenomena Research Topic. These scientific and engineering practices aim to reinforce the understanding of water's properties and establish connections to the properties of Solutions discussed in the lesson guide for Unit 9.1.

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

- Materials provide a "Teach and Discuss" section that provides guidance for teachers' recognition of common barriers to student conceptual development, including misconceptions. For example, in Unit 8, Lesson 8.3, under Teach and Discuss, the materials state, "When calculating specific heat, students often struggle with determining the initial temperature and final temperature in the problem. Be sure to emphasize the words to and from in problems to identify the initial and final temperatures. It may be beneficial to determine the direction of energy flow (and thus the sign of the temperature change) before performing the calculation to help reduce misidentifying the initial and final temperatures."
- The materials provide explanations of science concepts in the lesson guides provided for each lesson. For example, in Lesson Guide 5.3, the concept of metallic bonding is covered and is defined as it "can be explained by the sea of electrons model."
- Materials provide explanations and examples of student misconceptions within the differentiation and scaffolding lessons within each unit within the lesson guide. For example, in Unit 6 in the lesson guide for TEK 8.6E, there are misconceptions specifically listed within this component. For example, "Students may think that the law of conservation of mass does not apply to chemical reactions because a new substance forms. They may think that the mass increases because of the new substance. Instead, students must learn that the atoms get rearranged to form a new substance with the mass remaining the same."
- The materials provide guidance to support teachers' knowledge of the subject through explanations of science concepts. These materials provide supplementary learning resources to help teachers deepen their knowledge of complex science concepts. For example, in the "Teach and Discuss" section of Unit 10.1, the materials introduce the concepts of Arrhenius and Brønsted-Lowry acids and bases. The materials refer teachers to the Properties of Acids and Bases Reading activity to use Brønsted-Lowry theories to address exceptions of Arrhenius's definition. One of the main objectives of Unit 10.1 is to distinguish between Arrhenius and Brønsted-Lowry definitions (C.12B).

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

- The materials provide a framework explaining the main intent and goals of the program's instructional design. In the Teacher's Guide, materials provide several guidelines to explain the purpose of the instruction design used in the course. The Philosophy document describes the claim, evidence, and reasoning. The 5E Model document explains the reasons behind the order of the activities in each lesson guide and the rationale for using the 5E model for learning as the "curriculum is flexible, interactive and hands-on. It is designed for students to productively struggle and succeed," indicating that the materials are more student-centered than teacher-centered, with teachers working more in the role of facilitator. This very thorough document walks educators through the purpose and design of each E of the 5E model. Students learn how to ask questions using Engage and Explore activities, and they enhance their conceptual understanding in Apply and Extend activities with teacher guidance.

- Materials also provide Differentiated Teaching and Learning guidelines to explain how they create appropriate vertically aligned scaffolded contents for each unit lesson to differentiate and accelerate instruction. For example, while introducing Unit 10.1 about Types of Naming of Acids and Bases, teachers can provide a review lesson on the Properties of Acids and Bases. The teacher's guide outlines the program's goals; the publisher states that “scientific inquiry is the essence of learning science. Teachers are the key to success in science education. We believe in providing comprehensive support for all Texas students and sub-populations. Differentiation and acceleration are the new normal. Learning science content through RLA is imperative. Vocabulary mastery in context is a cornerstone of successful science teaching and learning. Delivering a science curriculum built for Texas is what our students and teachers expect and deserve.”

Summit K12 Dynamic 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 course-level appropriate scientific texts to gather evidence and develop an understanding of concepts. Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts. Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.

Evidence includes but is not limited to:

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

- The materials consistently support students' meaningful sensemaking through reading, writing, and thinking as scientists and engineers throughout various learning experiences within each lesson, including philosophy, to support students' sensemaking. The philosophy document in the teacher's materials emphasizes the need for students to learn science content through real-life application. This learning is accomplished throughout the materials via student use and application of content in laboratory assignments and their relation to real-life phenomena and other activities. This sensemaking encourages a deeper understanding of scientific concepts, as seen in Lesson 1.3, where teachers start asking students to answer, "What standard pieces of lab equipment have you used in the past, and what did you use them to do?" Students answer the question by doing a quick write for one minute and then sharing with a partner. The teacher then guides students in a brief discussion where misconceptions can be cleared up and gaps in knowledge can be filled. Next, students participate in a measurement stations lab where they work in a group to complete tasks of measurements at stations. Here students can help each other fill in gaps and make sense of learning. Students then read about how scientists use different types of evidence, reasoning, and testing to analyze, evaluate and critique scientific statements. The unit culminates with students acting like scientists, and students design, test, and evaluate a device to measure their lab table accurately. Another example is in Unit 4, Lesson 1; students complete an activity called “Practice: using electronegativity” to predict and reason what type of bond will form between elements based on electronegativity to make sense and demonstrate their sensemaking of how electronegativity influences bonds.

- Students have multiple opportunities to act as scientists and engineers throughout the materials. For example, in Unit 6, Lesson Guide 6.1, The Math of Chemistry, students begin the lesson acting and thinking like scientists by gathering data (of student heights in the class) and then analyzing the data like a scientist would. Another part of the activity is writing answers to the initial questions using evidence to support their claims from the data collected. Within this literacy connection, the SEPS [SEP C.2B] Analyze Data by Identifying Limitations and ELPS (3.D.i)(3.D.ii)(3.E.i) are identified to explain how students are acting as scientists and engineers.
- Materials sequence these activities carefully to enable students to develop the required competencies in reading, writing, and scientific inquiry before engaging in the role of scientists and engineers during a design project. For instance, in Unit 8.1, students design, test, and evaluate a container for transporting temperature-sensitive medication while minimizing heat loss in an engineering project. To effectively prepare students for this challenge, the materials guide teachers to facilitate activities that build their understanding of heat. These activities may include conducting the “Do You Feel the Heat?” investigation, reading the Four Laws of Thermodynamics, and developing skills to explain scientific concepts. Furthermore, teachers can monitor the resources utilized by each group and evaluate the final packaging designs from students based on their application of the laws of thermodynamics. By following this structured approach, students develop a solid foundation of knowledge and skills to conduct complex engineering design projects and engage critically and effectively in the design process.

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

- Materials provide multiple opportunities for students to engage with grade-level appropriate scientific texts to gather evidence and develop an understanding of concepts. For example, in Unit 3, Lesson 3.1, students analyze and evaluate the article on recycling rare earth metals to develop their questions and define problems with the current need for rare earth elements in technology. Students use evidence from the article to evaluate proposed solutions to this issue and its impact on society. Students have a reading guide to fill out as they read, which asks them to record two “I read, I wonder” statements and define problems based on the text. The reading guide also includes conclusion questions, such as “Which ideas stand out as original or inventive that could significantly impact society?” All of this helps students gather evidence and develop an understanding of concepts in the unit.
- Each unit contains segments called literacy connection. These segments include readings, reading guides, and an exemplar response to the reading guide questions. For example, in Unit 4, Lesson 1, the literacy connection segment covers the characteristics of ionic bonds. As students read, they also have a reading guide to help them focus on the important concepts.
- Materials also provide opportunities for students to engage with scientific texts to gather evidence and develop an understanding of concepts in each lesson guide. For example, in Unit 7, Lesson Guide 7.1, Kinetic Molecular Theory and Dalton's Law of Partial Pressures, students are

provided a text to read about the Kinetic Molecular Theory to develop an understanding of the concept and answer questions using evidence from the text.

- The materials establish a strong connection between literacy and scientific text, enabling students to analyze data, collect evidence, and develop a deep understanding of scientific concepts. In Unit 9.2, for example, the lesson guide includes three literacy-based activities to reinforce solubility rules and aid students in determining the insoluble product in a double replacement reaction. Materials provide a guidance document with purposeful questions for students to consider in the "Reactions Reading" activity. These questions assist students in analyzing concepts related to spectator ions, product prediction, and net ionic equations presented in the reading material. This step helps students build a solid foundation of knowledge and understanding. Next, students engage in the "Solubility Arguments" writing prompt to explore the solubility rules in a written format. This activity encourages students to articulate their understanding of the topic and apply the solubility rules to specific scenarios. By incorporating these literacy-based activities, the materials support students in developing their analytical skills, interpreting scientific information, and effectively communicating their understanding. The connection between scientific content and literacy empowers students to engage more deeply with the subject matter and build a strong foundation of scientific knowledge.

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 various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts. For example, in Unit 3, Lesson 3.1, students construct a periodic table using graphic cards and evidence and then write a paragraph identifying at least two advantages and limitations of their completed periodic table.
- Also, in Unit 4, Lesson 1, in the activity "Practice with Ionic Bonding and Lewis Structures," students demonstrate their understanding of ionic bonds by using the Lewis structures to show how electrons combine to create ionic bonds.
- Furthermore, in Unit 7, Lesson Guide 7.1, Kinetic Molecular Theory and Dalton's Law of Partial Pressures, there are multiple opportunities for students to engage with written and graphic modes of communication. The lesson begins with the opportunity for an investigation to develop visual models to understand the concept of phases of matter and phase changes. The lesson moves on to another mode of visual graphics with a digital animation for students to continue to develop an understanding of the Gas Motion Animation content. Further into the lesson, a literacy connection provides written information called Gas Properties: Postulates of Kinetic Molecular Theory to deepen students' knowledge of gasses. The lesson continues with more opportunities for written and graphic modes of communication from there.
- Finally, materials incorporate written and graphic models for students to demonstrate their understanding of scientific concepts. In Unit 8.1, for instance, students engage in a Thermal Conductivity using Spoons Demonstration. During this activity, students observe the melting of an ice cube on metal and plastic spoons, and subsequently, they draw a diagram depicting the movement of heat in each type of spoon. This exercise encourages students to represent their comprehension of thermal conductivity visually. Furthermore, materials employ visual models in the E-Poster of Lesson 8.1 to illustrate the four laws of thermodynamics. These models aid students in understanding these fundamental laws by providing visual representations that

enhance their grasp of the concepts. Then, students can apply that knowledge using a study guide that teachers can find in the Teacher's Resource. This study guide prompts students to write examples and ideas related to each law of thermodynamics. Additionally, students use a Venn diagram to compare and contrast scientific hypotheses and theories of thermodynamics. The study guides and visual tools support students in organizing their thoughts, making connections, and demonstrating their knowledge comprehensively. Additionally, in Unit 9.2, teachers guide students to create visual notes, allowing them to gather evidence and differentiate between total net ionic equations, ionic equations, and molecular equations. This visual representation helps students comprehend the distinctions between these equation types, enhancing their overall understanding of the topic.

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

- Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle. For example, in Unit 1, Lesson 1.3, students are given the following scenario: "Your job is to determine the recipe for the slime using the ingredients given. You must be able to produce 10 grams of slime to sell at a 50% profit per serving." Students have constraints such as price, ingredients, and timeframe, just like scientists and engineers. They are expected to follow the Engineering Design Process (EDP) and are not given step-by-step instructions by the teacher, so they have to come up with the steps to make the slime, which is where the productive struggle comes in. This part of the lesson supports students acting like scientists and engineers and making sense of the concepts of defining problems, designing solutions, and using measuring tools, all part of Unit 1.
- Also, materials allow students to support their claims and sensemaking using evidence-based reasoning. This practice results in a productive struggle in which students must explain to others how their data supports their claim using specific evidence. The students gain a deeper understanding of the content through this sensemaking process using reading, writing, and thinking in the context of being a scientist/ engineer. For example, in Unit 5, Lesson 3, students conduct an investigation in which they research and determine the physical and chemical properties of different compounds. Afterward, students use the molecular formula, the periodic table, and the physical characteristics to predict if the compounds are ionic or covalent. Students then share their predictions with others using the Claim, Evidence, Reasoning (CER) framework.
- In another example, students begin Unit 7, as stated in Lesson Guide 7.1, Kinetic Molecular Theory and Dalton's Law of Partial Pressures, with a phenomena-based approach to understanding how popcorn kernels become popcorn in the Popcorn and Water Models of Phase Changes investigation. Students are asked to act as scientists to discover how this phenomenon happens. Then further in the investigation, students are to act as engineers to solve the problem of developing another way to effectively model the science concepts learned. This model allows students to design processes, make sense of concepts, and productively struggle through the understanding and designing of the investigation.
- Finally, the materials actively engage students through activities that establish relevance by connecting them to real-world phenomena. Each lesson or unit concludes with an engineering design project for students to apply what they have learned, actively engage in productive struggles, and purposefully apply their knowledge. For instance, in the lesson guide of Unit 8.1, the materials use the concept of messy or neat backpacks to help students grasp the second law

of thermodynamics. At the end of the lesson guide, students must design a container to transport temperature-sensitive medication while keeping it cold, applying their understanding of the laws of thermodynamics. During this design process, students collaborate in groups to explore the thermal conductivity of different materials. This exercise encourages students to engage in productive struggles as they seek the optimal cost-to-temperature ratio for their designs. The materials suggest that students test their ideas by using a cold cup of applesauce and make any necessary revisions to their models. To succeed in this engineering project, students must effectively apply their knowledge of the laws of thermodynamics, demonstrating a practical understanding of the subject matter. By incorporating these engineering design projects, the materials promote active and relevant learning experiences for students to act and think as scientists.

Summit K12 Dynamic 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.	M
4	Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations to phenomena and/or solutions to problems using evidence acquired from learning experiences.	M

Meets | Score 4/4

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

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

Evidence includes but is not limited to:

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

- Materials prompt students to use evidence to support their hypotheses and claims through the Claims-Evidence-Reasoning (CER) writing framework. For example, in Unit 1, Lesson 1.1, students write a CER during the safety demonstration and use their observations to support the claim that wearing goggles is essential to lab safety. Additionally, in Unit 5, Lesson 3, students complete an investigation in which they conduct a series of quantitative tests to determine whether various compounds are ionic or covalent. In the lesson guide, the activity description ("Investigating and Comparing Properties of Ionic and Covalent Compounds") states that students will use CER to support their claims. This instructional strategy requires students to make a claim, find evidence that supports that claim, and then explain or explain how that evidence supports their claim.
- Materials prompt students to use evidence to support their hypotheses and claim through various learning experiences within every 5E instructional model. For example, in Unit 7, Lesson 6.6A, there is an activity called Particle Movement in the Engage section of the lesson cycle. In this activity, students predict how long a scent will take to travel to them within a room. They

are then prompted to collect and use that evidence to support or refute their prediction. Additionally, in Lesson 3.1, students analyze and evaluate the article on recycling rare earth metals to develop their questions and define problems with the current need for rare earth elements in technology. Students use evidence from the article to evaluate proposed solutions to this issue and its impact on society.
- Moreover, Lesson Guide 9.1 presents the “Melting Glaciers Experimental Investigation.” In this activity, students begin by viewing a class documentary about the impact of melting Arctic ice. Subsequently, students design an experimental investigation to ascertain whether the presence of melting icebergs in surrounding water hinders the melting process. Students formulate a testable hypothesis and design an experiment utilizing the provided materials. Following the experiment plan, they record their results and meticulously analyze their data, culminating in the completion of a CER statement that elucidates the influence of salt concentration in water on the rate of ice melting, supported by their gathered evidence.

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

- Materials offer diverse opportunities with embedded links for students to cultivate and effectively employ scientific vocabulary within contextual settings. Materials provide a comprehensive list of the core vocabulary covered in each lesson. Within every lesson guide, students encounter multiple representations designed to reinforce the usage of the presented vocabulary within a scientific context. For example, in Unit 1, Lesson 1.1, students use a Frayer model to define and illustrate the vocabulary words waft and SDS. In Unit 2, Lesson 2.1, students create a content frame and list a synonym, example, or labeled drawing of the following: Bohr model, electron, energy level, neutron, nucleus, orbit, proton, subatomic particle, cathode ray, gold-foil experiment, modern atomic theory, and spin. Additionally, in Unit 2, Lesson 2.4, students use new basic and academic language as they write a paragraph. Students show internalization by defining new terms, relating new vocabulary to previous terms, and creating a mind map. Every unit has embedded opportunities for students to utilize scientific vocabulary in context.
- Additionally, in the third Literacy Connection, “Electronegativity and Bonding,” from Unit 5, Lesson 1, the activity summary specifically states that "students learn new language structures, expressions, and vocabulary by sharing responses.” Students are expected to use the newly learned vocabulary and language structures within their response to the following questions, “How does electronegativity affect bonding?” and “Think about ionic bonds and the 1.7 rule. How does that differ from covalent bonding?”
- Furthermore, within Unit 7, Lesson Guide 7.1, students see the vocabulary of the Kinetic Molecular Theory (KMT) in action with the activity named Gas Motion Animation. Then they build on that knowledge of the KMT vocabulary by reading about it in the next section labeled Gas Properties: Postulates of the Kinetic Molecular Theory and then utilizing their knowledge to answer some guiding questions: “Ask why they chose to round to that decimal place. What did the calculator report? What was the difference? What are the limitations of the data collected, and how could this activity improve the standardization of the collected data?”
- Finally, in Lesson Guide 9.3, materials offer a core vocabulary list centered around molarity. During the Engage section, materials prompt students to incorporate terms such as solvent, solute, and solution in their responses to the “I Notice, I Wonder” activity focused on solution concentrations. Students document their observations from a series of flasks containing colored water solutions, each with the same volume but varying concentrations. Sharing their responses with partners, students then engage in a class discussion. Materials additionally offer a Molarity

and Reading Practice section, providing guidelines after introducing concentration concepts in the Teach and Discuss section. Here, students complete a reading guide for elucidating techniques to compare solution concentrations and calculate molarity. They also delve into the topics of concentrated solutions and dilution. Students apply their newly acquired vocabulary knowledge through practice questions, which require them to describe the process of creating concentrated and diluted solutions supported by illustrations. Furthermore, students tackle challenge questions that involve determining solute and solvent and employing molarity formulas to address them effectively.

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

- Materials integrate argumentation and discourse throughout to support students' content knowledge and skills development as appropriate for the concept and course. For example, in Unit 2, Lesson 2.3, Nuclear Chemistry, students can read about the history of nuclear power and explore current clean energy sources, such as wind and solar energy. Students write a brief paragraph "explaining your position on nuclear power as a clean energy source. In your paragraph, discuss the potential benefit to society and the potential cost. Research other information about where the spent fuel goes after use and other environmental impacts. Be sure to cite your sources."
- Additionally, in Unit 5, Lesson 1, Lesson Guide, the materials push students to think beyond simple recall within the literacy connection, where students are tasked with developing arguments for placing elements on the periodic table. Students respond to, "How does the placement of an element on the periodic table affect bonding and electronegativity?" Then students "construct an argument about how the placement of an element on the periodic table affects bonding."
- Also, in Unit 6, Lesson Guide 6.1, The Math of Chemistry, in the Engage section of the lesson, students are first asked to explain how math is the language of science. Teachers facilitate a class discussion which provides opportunities for argumentation and discourse. In the engage section of 6.1, Using Calculations in Chemistry, students measure themselves and write their height on the board. The class average is calculated, and then students discuss the process and how to make this data collection process more accurate.
- Furthermore, in Lesson Guide 10.2, materials present the "Are They Strong or Weak?" activity, which involves a list of acids for students to analyze. In this activity, materials provide students with a data table displaying the concentration of the acid, the concentration of hydrogen ions, the ability to conduct electricity, and the pH of a 0.50 M solution of each acid. Students form their arguments about whether the acids are strong or weak using their recently acquired knowledge about strong acids, including the percentage of $H+$ ions, conductivity, and complete dissociation in solution. Their arguments and conclusions may vary depending on the specific criteria used. Furthermore, after constructing their arguments and reaching conclusions, materials prompt students to communicate their argumentation and supporting evidence to their classmates. Following the communication phase, students can delve into the challenge question, which applies their knowledge and skills in a more complex context.

Materials provide opportunities for students to construct and present developmentally appropriate written and verbal arguments that justify explanations to phenomena and/or solutions to problems using evidence acquired from learning experiences.

- Materials provide opportunities for students to construct and present developmentally appropriate written and/or verbal arguments through research, projects, and investigations that utilize CER as a framework for students to construct their arguments. For example, in Unit 2, Lesson 2.3, in the Radium Girls Project, students research and present the devastating effects of radium poisoning on young women and how it impacted the health of young workers, changed working conditions for workers, and left an environmental scar. In this same unit and lesson, students read about the history of nuclear power and explore current clean energy sources, such as wind and solar energy. Students write about their thoughts regarding nuclear power as a clean energy source.
- Additionally, in Unit 4, Lesson 2, students conduct the “Naming and Writing Formulas” investigation. In this investigation, students mix different compounds to determine if they will create ionic compounds. Students then use the CER framework to construct a written response. In another activity from Unit 5, Lesson 1, students construct responses to the question, “How do you think covalent compounds differ from ionic compounds since they share electrons instead of transferring them?” After students construct their responses, they present their responses to a partner and the reasoning behind their thoughts.
- Also, in Unit 7, Behavior of Gasses, in Lesson Guide 7.2, Relationships Between Variables of a Gas, students can explore what type of pressure is needed to make a kernel pop into popcorn in the “Ideal Popcorn Investigation.” Students have the opportunity to write about what they experience and learn from this phenomenon.
- Finally, in Lesson Guide 9.3, the materials introduce an engineering project addressing potable water problems. Students read an article from the American Chemical Society (ACS) that showcases how high schoolers have developed an inexpensive filter to remove lead from tap water. Additionally, a video from a TED Talk demonstrates methods for transforming contaminated water into drinkable water. To commence the project, students collaborate in groups, collectively composing two to four paragraphs that address the identified problems. Then, students follow brainstorming guidelines, encouraging them to defer judgment and take note of promising ideas. Following this, students develop a plan and construct a prototype, which they can test to collect evidence. The data collected during the testing phase allows students to evaluate the effectiveness of their prototype. Throughout this process, students work together, engaging in design and collaborative efforts. The instructional materials further prompt students to contemplate how they will present their arguments. Students create a poster or an electronic presentation, which they showcase at the Clean Water Symposium. During this event, their peers evaluate and provide feedback on their ideas, fostering a collaborative and interactive learning environment.

Indicator 5.2

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

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

Meets | Score 4/4

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

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

Evidence includes but is not limited to:

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

- Materials provide teacher guidance on anticipating student responses and the use of questioning to deepen student thinking. In each lesson guide, materials provide accompanying text for every activity that references the knowledge and skills students will attain and strategies to engage them through thoughtful questioning. The materials also provide examples of possible student responses. For example, in Unit 2, Lesson 2.4, students respond to the following question by writing for one minute and then sharing with a partner: "Guide students in a brief discussion based on their answers. How does the arrangement and placement of electrons in an atom's electron cloud affect its properties?" Teacher guidance on anticipating student responses states, "Answers may vary. Possible answers include the outermost electrons affect properties and reactivity, the number of filled or partially filled energy levels affects the size, and the electrons being paired or unpaired in an orbital can affect the magnetism of that element."
- Additionally, in Chapter 5, Lesson 1, students are prompted with the question, "How do you think covalent compounds are different from ionic compounds since they share electrons instead of transferring them?" Beneath this prompt, teachers are guided with "possible answers include that bonds may be weaker, atoms may combine in different ratios, or they may have different chemical or physical properties." By providing the likely responses, the materials allow teachers to gauge where their students are, specifically with this concept in critical thinking. If

teachers know how their students' responses compare to the expected responses, they can hone in on key points or work on critical thinking to adjust their aim to either build students up further or to extend their learning, both of which assist students in the mastery of content in the long run.

- Moreover, in Lesson Guide 8.2, materials offer numerous activities, accompanied by teacher guidance on anticipating student responses and utilizing questioning techniques to encourage a deeper understanding of endothermic and exothermic reactions in the Calorimetry Heat of Solution Virtual Lab. In the activity, the materials emphasize the significance of energy diagrams in representing reaction energy. They acknowledge that while students may not be familiar with all the intricacies of activation energy, they should recognize the term and its depiction in an energy diagram. In the teacher's notes, the materials offer possible answers for the Claim-Evidence-Reasoning (CER) process, along with potential teacher responses. For example, if a student argues that sodium nitrate is more stable than ammonium nitrate as the temperature increases based on the data, the materials suggest considering this viewpoint. However, they also encourage teachers to entertain alternative arguments if students present compelling justifications. In the Energy Changes when Melting Ice Investigation, materials provide teachers with the sample data and graphs. This activity includes thought-provoking questions for teachers to deepen students' understanding during the CER practice. These questions might address instances when the temperature increases rapidly versus when it does not or why the graph during the phase change is not entirely flat.

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

- Materials include teacher guidance on scaffolding and supporting students' development and using scientific vocabulary in context. The materials offer various resources and guidance to support teachers in enhancing students' mastery of scientific vocabulary. Specifically, teachers can refer to the Vocabulary Mastery tab within the guide. This tab includes a teacher guidance document in the Concept Mastery section, which provides strategies and instructions for scaffolding and supporting vocabulary in context. According to the teacher's guide, materials provide flashcards with randomized sequences and drop-down lists to facilitate students' comprehension and application of scientific terminology. These core vocabulary lists in the lesson guide contribute to students' understanding of core vocabulary terms, such as ionization, alkaline, and acid-base reaction. Additionally, the materials mention the availability of online vocabulary practice in the Concept Mastery section. This online practice not only scaffolds students' development of scientific vocabulary but also requires them to apply their knowledge. For example, in Unit 2, Lesson 2.4, the activity states, "Students will use the words energy level, orbital, sublevel, valence electron, Aufbau principle, Hund's rule, Pauli exclusion principle, spin, and orbital diagram to write a paragraph using these terms correctly." The teacher's guidance is "Additionally, they could create illustrated notes or a mind map showing the relationships between these terms."
- Additionally, Unit 4, Lesson 1, is about the different types of bonding and the process of bonding, specifically pertaining to Ionic bonding. Students complete an activity in which they watch an animation of the formation of an ionic bond. Before watching the animation, the activity has teachers ask the students to describe what they see to their neighbor, which gets students to practice using the vocabulary just defined in the mini-lecture. The lesson guide then instructs teachers to play the animation, have students describe what happened, and share it with partners. Lastly, students are instructed to explain how they know the animation is of an

ionic bond forming. This particular activity begins with students simply using the content vocabulary to describe what they see and progress to students creating their unique explanation of what happened. This process of moving from less complex to more difficult grounds the student in definitions and provides content-based practice of the terminology, leading to a greater understanding of the content. At the bottom of the activity, the materials summarize the goal for students to internalize the new basic and academic language and that students should include new language and vocabulary in their descriptions of the animation.

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

- The materials guide teachers in preparing for student discourse and supporting students in using evidence to construct written and verbal claims. For example, in Unit 1, Lesson 1.1, in the Safety Demonstration CER, the materials provide teacher guidance on CER writing, stating, "It may be helpful to go through an example with the students to emphasize the sections and how they differ. One example is to have students complete a CER about whether beakers of the same size have the same mass. Or, they can complete a CER about whether doubling the power setting on a hot plate will halve the time it takes for a water sample to boil. These quick activities can be performed to give students data that can be used for their evidence to practice writing a CER. They can also be done as a demonstration, and students can write CERs in groups." The materials also include a general CER rubric that teachers can give students to help them construct written and verbal claims throughout the year in chemistry.
- Moreover, in Lesson Guide 9.1, the materials introduce the concept of gas solubility in a liquid and the impact of temperature through an activity called the "Gases in Solution Demonstration – Effect of Temperature on Gas Solubility in a Liquid." During this activity, materials prompt students to claim in response to the question: "Should you keep soda on the counter or in the refrigerator to keep it fizzy?" To support their argumentation, students engage in a teacher-led demonstration, guided questioning, and drawing upon their understanding of the dissolving process of gasses in solids and liquids. The materials provide a CER framework for teachers to guide students in employing and constructing a well-structured argument, which includes a claim, evidence, and reasoning statement. Throughout this process, the materials provide teachers with targeted questions to assist students in developing their claims. For example, teachers may ask questions like "Why does temperature determine whether the gas remains dissolved or leaves the solution?" or "What sound do they hear when they open a soda, and why does that sound occur?" These questions prompt students to critically analyze the factors influencing gas solubility and incorporate evidence into their arguments. Furthermore, the materials offer questions that encourage students to utilize evidence to support their claims during discussions. For instance, teachers instruct students to lead a discussion about the effect of temperature on the dissolution of solids in liquids. These thoughtful questions foster student engagement and facilitate the use of evidence to strengthen their arguments. Materials provide a Dissolving Gasses in Liquids CER guide towards the end of the handout. This guide offers a framework for students to analyze and develop evidence-based claims.

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

- Materials support and guide teachers in facilitating the sharing of students' thinking and finding solutions. Throughout the course, materials provide teachers with strategies to engage student thinking and encourage effective communication in various modes. For example, in Unit 1, Lesson 1.1, in the activity "How does Science Work," the materials guide teachers in facilitating the sharing of students' thinking and finding solutions to the posed scenario "Residents near a local stream noticed that hundreds of dead fish had washed up near the shore. What do you think may have caused the fish to die?" The materials guide the teacher to take the students through the following: "Help students develop a hypothesis based on their question. Remind students that a hypothesis is a testable explanation or prediction that can be tested using further investigation. Use the guiding questions to lead a class discussion and help students develop a hypothesis that the fish kill could have been caused by run-off from the pesticide that changed the acidity of the water. Guiding Questions: 1. What could have caused the pollution in the water? 2. How would this affect the water? What properties of the water might it change?" The materials continue guiding the teacher in supporting the students through planning and investigation.

- Additionally, Chapter 5, Lesson 3, contains an activity called "Demonstration—Intro Penny Activity," in which students learn about the properties of polar molecules such as water. The teacher's guidance prompts the teacher to have students recall a personal experience in which they may have seen an insect walking on water and think about how it might be possible. The teacher then demonstrates surface tension and cohesive/adhesive properties of water by applying water to the surface of a penny. After the demonstration, teachers are guided to facilitate the sharing of student thinking by having them respond to questions and then lead a classwide discussion over their explanations for why the phenomena happen. The entire activity sets the stage for future learning in which students examine polar and non-polar substances and metallic bonding.
- Moreover, in Lesson Guide 8.2, a notable example is the "Is Older Better?" activity. In this activity, students begin by independently or collaboratively reading articles to gain familiarity with the topic. Once they have gathered insights from the articles, teachers initiate a class discussion, creating a platform for students to share their ideas and perspectives regarding the history of concrete. To facilitate this discussion, teachers employ guided questions that prompt students to delve into how historical discoveries have shaped current scientific innovations or how technological advancements have impacted the field of material science. As students actively engage in the discussion, they strive to find optimal solutions for the project. They then research different types of infographics and select the format that best aligns with their arguments and presentation style. Students seek feedback from their peers by sharing their argumentation with classmates, fostering a collaborative learning environment. By providing guidance for discussion facilitation, encouraging research and exploration, and promoting peer feedback, the materials empower students to communicate their ideas and seek innovative solutions.

Indicator 6.1

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- The materials include pre-assessments for teachers to use as diagnostic assessments to evaluate prior learning before the start of each unit. For example, Unit 2, Lesson 2.3, starts with an informal pre-assessment of student knowledge of nuclear power. The materials state, “Using prior knowledge, write down as many real-world uses of nuclear power and radiation as possible in one minute.”
- The materials also provide a variety of formative assessments for teachers to evaluate student learning as they progress through the units. For example, in Unit 7, Behavior of Gases, Lesson Guide 7.2, Relationships Between Variables of a Gas, students complete a graphic organizer based on their reading covering gas variables. Teachers can look at the graphic organizers and quickly see whether students grasped the concepts in the reading or if they need to redirect the students back to certain parts or do a reteach for the whole class. The materials also provide digital animations for students to demonstrate each gas law. Teachers can assess student understanding of the content from this activity.
- Additionally, in Lesson Guide 8.3, the materials provide teachers with problem-solving exercises in the “Specific Heat Reading and Practice Problem” handout. This resource presents problems that assess the student's ability to calculate heat change by considering the substance's identity, mass, and temperature change. Also, teachers can utilize the “Calorimetry-Burning Your Snacks” investigation to evaluate student comprehension of energy calculation by analyzing data from

the combustion of snacks in water and applying the formula $q=mc\Delta T$ to determine the calories released. In addition, the materials include an Honor Only Assessment, enabling teachers to gauge the level of student understanding regarding calorimetry and the calculation of enthalpy from heating and cooling curves.

- The materials also provide various summative assessment options. In the Concept Mastery button for Unit 2, Lesson 2.3, Nuclear Chemistry, there is a Formative Assessment 1, a Vocabulary Practice, and a Formative Assessment 2 available for teachers to assign students. Teachers can use the first formative assessment as a pretest and the second as a formal formative assessment for the lesson to monitor student growth. Also, teachers can create summative assessments using the assessment bank by selecting specific questions for the TEKS in the Nuclear Chemistry unit. This bank allows teachers to utilize different question types, set test lengths, adjust the percentage of dual-coded items, and adjust the ratio of all the different question types.

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

- The materials comprehensively assess all student expectations in alignment with the Texas Essential Knowledge and Skills (TEKS) for the course. The lesson guides in the materials begin with the TEKS number and description, providing a clear overview of the expectations covered within each unit. For example, in Unit 7, Behavior of Gases, Lesson Guide 7.1, Kinetic Molecular Theory and Dalton's Law of Partial Pressure, the lesson says it covers C10A, "describe the postulates of the kinetic molecular theory" and C10C, "define and apply Dalton's law of partial pressure" in the lesson's activities.
- The materials are very explicit in indicating which student expectations are assessed. For example, in the Concept Mastery button, Formative Assessments 1 and 2 have the TEKS listed. Also, the Vocabulary Practice in the Concept Mastery and the Vocabulary Mastery Practice in the Science Literacy button have the TEKS listed. A specific example is Unit 3, Nuclear Chemistry Formative Assessment 1, which shows TEKS C.14A - Describe the characteristics of alpha, beta, and gamma radioactive decay processes in terms of a balanced nuclear equation, C.14B - Compare fission and fusion reactions, and C.14C - Give examples of applications of nuclear phenomena such as nuclear stability, radiation therapy, diagnostic imaging, solar cells, and nuclear power assessed with this formative assessment. A specific question example from Assessment 1 is "What type of radioactive decay results in the release of a helium nucleus? a. Gamma, b. Alpha, c. Beta, d. X-ray." This question assesses TEK C.14A. Additionally, if a question also covers a SEP, it will also be listed within the question, as seen in Unit 7, Behavior of Gases, in Formative Assessment 1, Question 7, where TEK C2.C "use mathematical calculations to assess quantitative relationships in data" is also part of the processing a student will do because of the nature of the question.

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

- The materials allow students to integrate scientific concepts and science and engineering practices through various hands-on activities. For example, in Unit 1, Lesson 1.3, students use scientific concepts and science and engineering practices to create a recipe for slime to earn money for homecoming. In this assessment, students use TEKS 1.3 - Measuring Tools and Measurement and SEPs C.1A - Define Problems, C.1B - Use Engineering Practices To Design Solutions, and C.2D - Evaluate Engineering Designs. The student's job is to determine the recipe for the slime using the ingredients given. They must be able to produce 10 grams of slime to sell at a 50% profit per serving.

- Additionally, in Unit 10.2, students engage in the “Effect of Acid or Base Strength on pH and Conductivity Virtual Lab.” This assessment requires students to develop explanations of the relationship between acid or base strength and pH. This interactive experience promotes a deeper understanding of the topic. For this activity, materials include the SEPs: [SEP C.1B] Plan and Conduct an Investigation, [SEP C.1G] Develop and Use Models, and [SEP C.3A] Develop Explanations.
- The materials allow students to integrate scientific concepts and science and engineering practices with real-world examples. For instance, in the lesson guide for Unit 9.1, students explore STEM careers through the Literacy Connection activity titled “Making Water Safe for Consumption STEM Careers.” During this activity, students research a STEM career related to the water industry and create a brochure to present at a mock job fair within their class. By doing so, students learn about and showcase careers that contribute to ensuring safe drinking water for various communities. This activity relates to the [SEP C.4C] Research and explores STEM careers.
- The materials also allow students to integrate scientific concepts and science and engineering practices within unit assessments. For example, Lesson 6.1, The Math of Chemistry, states that it covers TEKS C8.C and C8.D: “Calculate the percent composition of compounds and differentiate between empirical and molecular formulas.” But, within the Formative Assessments, other science and engineering standards are listed within various questions when appropriate. In Formative Assessment 1 of Lesson 6.1, Question 1 also lists TEK C2.C “use mathematical calculations to assess quantitative relationships in data” because the question also has students use math calculations along with TEKS C8.C and C8.D. Question 1 states, “During a density lab, the volume of an object is recorded as 19.5 mL, and the mass as 11g. Which of the following represents the calculated density with the proper number of significant figures? (D = m/V) [C.2C].”

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

- The materials allow students to apply the knowledge and skills they learn to novel contexts. For example, in Unit 1, Lesson 1.3, students design, test, and evaluate a device to measure their lab table accurately. In this assessment, students use the skills they learn in Lesson 1.3 on measurement and apply them in a novel context to design a device to measure their lab table. The materials state, “You need to measure the piece of furniture as accurately as possible. Unfortunately, all your measuring tools are on the job site instead of at home, and the only materials you have available are some office supplies. You must design a measuring device to determine the furniture’s dimensions as precisely as possible.” Students use TEKS C.1D Use appropriate tools such as electronic balances and scientific glassware and C.1E Collect quantitative data using the International System of Units (SI) and qualitative data as evidence. as well as [SEP C.1A] Define Problems,[SEP C.1B] Use Engineering Practices to Design Solutions to Problems,[SEP C.2D] Evaluate Engineering Designs,[SEP C.4A] Analyze and Evaluate Solutions.
- Additionally, Unit 4, Lesson 1, culminates in an investigation called “Be the Scientists—Is it Ionic?” which can be found in the lesson guide. This investigation has students develop a methodology to determine if different substances are ionic, then conduct the experiment using their methodology and finally, write a conclusion using data gathered to support their claim. Furthermore, at the end of Lesson Guide 7.2, Relationships Between Variables of a Gas, there is an investigation that has students use all of their knowledge learned through the lesson and

apply it to a novel context of dissolved oxygen in water from nearby water sources. The investigation says: "Students will collect samples from a nearby pond or stream to study the effect of temperature on dissolved oxygen. After the investigation, students will write a Claims-Evidence-Reasoning [CER] statement independently and then peer review their partner's explanations." The CER is an assessment requiring students to apply their knowledge towards real-world phenomena for teachers to gauge their learning of the content of the TEKS C10.B relationships of gas variables, SEP C.1C Use Appropriate Safety Equipment and Practices, SEP C.1D Use Appropriate Tools, SEP C.1E Collect Data as Evidence, and SEP C.3C Engage in Scientific Argumentation.

- Moreover, in Lesson Guide 9.1, in the Gas Solubility Virtual Lab, materials require students to apply the concept of gas solubility in a liquid and its relationship with temperature through the prompt: "Should you keep soda on the counter or in the refrigerator to keep it fizzy?" Students make a claim and support it with evidence. They gather evidence through a teacher's demonstration, guided questions, and their understanding of the dissolving process of gasses in solids and liquids. Students construct a well-structured argument, including a claim, evidence, and reasoning statement. This assessment challenges students to apply their knowledge and encourages critical thinking and scientific reasoning.

Summit K12 Dynamic 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.	M
2	Materials support teachers' analysis of assessment data with guidance and direction to respond to individual students' needs, in all areas of science, based on measures of student progress appropriate for the developmental level.	M
3	Assessment tools yield relevant information for teachers to use when planning instruction, intervention, and extension.	M
4	Materials provide a variety of resources and teacher guidance on how to leverage different activities to respond to student data.	M

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials include information and/or resources that guide evaluating student responses in various ways through questions and expected responses. For example, in Unit 2, Lesson 2.4, the materials include the question, "How does the arrangement and placement of electrons in an atom's electron cloud affect its properties?" The materials include the teacher's guidance "Answers may vary. Possible answers include the outermost electrons affecting properties and reactivity, the number of filled or partially filled energy levels affecting the size, and the electrons being paired or unpaired in an orbital can affect the magnetism of that element."
- Additionally, the materials provide study guides with keys explaining expected responses. For example, from the study guide for Lesson 2.4, one question asks, "Why do you think someone would choose to draw an orbital diagram for an element instead of writing an electron configuration?" The teacher guidance from the study guide key states, "Answers may vary. An orbital diagram shows in detail the orbitals electrons occupy, if the electrons are paired or in singles in orbitals, and if there are empty orbitals within a sublevel. The electron configuration shows sublevels and total electrons per sublevel but nothing about how the electrons are spread out within the orbitals in each sublevel."
- Furthermore, each lesson has a review with an accompanying answer key. The review employs various question types, including but not limited to multiple-choice, short-answer, open-ended, fill-in-the-blank, and matching. The materials provide teachers with support in evaluating the

open-ended questions in the form of exemplar answers emphasizing key points students should mention. For example, in Unit 5, Lesson 3 review, one question states, “Draw a diagram of the sea of electrons model of metallic bonding. Label nuclear cores and delocalized electrons.” The key provides a detailed labeled diagram as an exemplar response. Another question asks students to summarize the difference between the intramolecular forces in ionic, covalent, and metallic bonding. The key lists the following points students should mention in their answer: electrostatic attraction for ionic compounds, sharing of electrons which create covalent bonds, and movement of valence electrons causing intramolecular forces of metallic bonding.

- Moreover, the materials contain research projects that include item-specific rubrics to guide teachers in assessing them. Lesson Guide 8.2 suggests the research project “Is Older Better,” where students create an infographic about concrete and its evolution. The rubric includes five criteria, each with specific guidance for evaluation. The rubric employs a grading scale consisting of five levels: absent (0), poor (1), developing (2), progressing (3), accomplished (4), and exemplary (5). The rubric provides clear descriptions and guidelines for each level. For instance, in the absent (0) category, materials indicate this score applies to students that do not submit notes, summaries, or visuals. In the progressing (3) category, the rubric highlights that student work is incomplete, lacks clarity, or is missing some key elements. By incorporating these item-specific rubrics and grading scales, the materials assist teachers in evaluating and providing meaningful feedback on student responses. This structured approach ensures consistency in assessment and supports students in understanding their strengths and areas for improvement.

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

- The materials provide a Teacher's Guide containing an assessment bank document that informs teachers that they can create customized assessments for their students and utilize student data such as average scores and PLD (Performance Level Descriptors). The Teacher's Guide also includes a Concept Mastery document, providing guidance and tools to help teachers utilize data to inform their instructional practices. In this document, materials mention that students need to score at least 80% on the TEKs Vocabulary section to unlock Formative Assessment 2 after completing Formative Assessment 1. The materials in the Assessment Bank document illustrate color labels associated with different performance levels. Students within the “Approach” level are coded purple, those in the “Meet” level are blue, and students in the “Master” range are coded green. The materials also provide support for teachers' analysis of assessment data with guidance and direction to respond to individual students’ needs. A teacher can see how many students have worked on a specific TEKS and the class average performance for Formative Assessment 1 (1st), Vocabulary Boosters (VB), and Formative Assessment 2 (2nd). To view student responses for an individual practice activity or assessment, teachers click on the student's name. Then, they click on the hyperlinked checkmark or score. For example, for Concept Boosters, each individual student’s score is available for the teacher broken down by standard. The reports also give the teacher the number of attempts students have taken. In the Help Center, teachers can also find guidance for analyzing the reports. All of this supports teachers' analysis of assessment data with guidance and direction to respond to individual students’ needs, in all areas of science, based on measures of student progress appropriate for the developmental level.
- The curriculum materials include a dedicated remediation section for teachers to assign to students. This feature assists teachers in addressing the specific needs of students who

consistently fall short of achieving an 80% score. Moreover, within the K12 lesson guides, specifically in the Apply and Extend section, teachers are presented with a range of options for differentiation. For instance, in Unit 6, Stoichiometry, educators can select three to five supplementary activities tailored to support struggling students. In Lesson Guide 6.2, which covers the topics of mole, Avogadro's number, and mole conversions, the materials offer three distinct activities designed to enable teachers to meet the unique requirements of individual students. These activities are particularly valuable for helping students comprehend concepts related to converting grams to moles to particles, as well as calculating the necessary grams of reactants based on particle quantities. By analyzing assessment data from tasks such as "Putting it together: Calculating Mass and Particles," which involves conversions from grams to moles to particles, and "Calculating how many grams to react," a calculation related to reactant quantities based on particle considerations, teachers can effectively tailor their instructional approaches to address students' specific learning needs..

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

- The materials provide a Concept Mastery document found in the Teacher's Guide in the Concept Mastery link guides teachers in how to respond to students' needs based on how they do on assessments. For example, the materials tell teachers to have students start with Formative Assessments 1 and then have students watch the TEKs video. Students then must take the Vocabulary TEKS section and score 80% before Formative Assessment 2 will unlock. The guidance includes that teachers may assign lower grade level vertically aligned scaffolds as needed to differentiate instruction.
- Additionally, the online platform allows teachers to create different reports from assessment data, which teachers can utilize during planning instruction, intervention, and extensions. The materials in the Assessment Bank document illustrate color labels associated with different performance levels that will appear on the assessment reports. Students within the "Approach" range have a purple color, those in the "Meet" range with blue, and students in the "Master" range with green. This differentiation is relevant data that can be utilized in planning. Teachers also have the option to create a pre-test before each assessment is given so students can review, and teachers can also use this data to remediate or extend as needed.

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

The materials provide teachers with a wide variety of resources to respond to student needs based on assessment data. The resources include TEKS vertically aligned scaffolds, projects, interactive E-Posters, videos, concept mastery quizzes, laboratory experiments, and extension activities. For example, in Unit 2, three scaffolded lessons are available (8.6B, IPC 5D, IPC 8C), a Project on Nuclear Chemistry in Real Life, and several extension activities, including virtual labs and literacy connection activities. Another example is Lesson Guide 7.1, Kinetic Molecular Theory and Dalton's Law of Partial Pressures. Three activities are available in the Apply and Extend section: Extra Unit Conversion Practice, Dalton's Law Practice, and Mole Fractions Practice. The resources provide different activities in the Apply and Extend section of each of the lesson guides. The teacher, being the instructional decision-maker, is responsible for making decisions based on the individualized needs of each learner. Therefore, the teacher can utilize these activities in response to struggling students. Additionally, because these activities are differentiated for different learning styles, teachers can select the activities that best fit students' individual learning styles. For example, within the Unit 5, Lesson 3 guide, the Apply and Extend section contains three activities: Predicting Bonding Between Elements In A Compound, Covalent Naming and Formula Writing Practice, and What Am I? Bonding activity. The second activity is meant for more visual learners, as it uses a virtual game, whereas the third activity is tactile, as it is a laboratory experiment. All of these activities are meant to help students master writing and naming formulas.

Indicator 6.3

Assessments are clear and easy to understand.

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- The materials' assessments contain items that are scientifically accurate and free from errors. For example, in Unit 5, Lesson 2, students learn how molecular structure relates to molecular geometry. In the assessment at the end of this lesson, the materials pose a multiple-choice question about the structural characteristics of a molecule with linear geometry. The correct response in the teacher's version defines linear geometry as two bonded atoms around a central atom with zero lone pair. This question gives an accurate description of a linear molecule. Additionally, in Formative Assessment 1 of Unit 6, Lesson 6.1, Question 1 asks students to calculate the density of an object. It states, "During a density lab, the volume of an object is recorded as 19.5 mL, and the mass as 11g. Which of the following represents the calculated density with the proper number of significant figures? (D = m/V) [C.2C]" This question accurately provides the volume measurements in mL and mass in grams which are both needed to calculate density. The answer given is error-free, showing the correct calculation and number of significant figures.
- The materials' assessments contain items that avoid bias. The questions show a representation of diversity. For example, in the Concept Mastery Formative Assessment 1 for Accuracy and Precision lesson, Question 1 states, "Damian and Abed weighed paper clips for an experiment and recorded their data in the table below." The question contains a table with two columns. The first column has the trial number and five trials. The second column has the mass of the paper clip listed. It continues, "After they analyzed their data, they learned that the actual mass of the paperclip was 1.6 g. Why should they repeat the experiment? [C.1F]" The questions may contain illustrations to provide visual support for all students. For example, in the Vocabulary

section of the Concept Mastery, in the first question of the Types and Naming Acids and Bases section, the materials include a picture of a pH scale from 1 to 14. The illustration features a needle at number 7, indicating a neutral pH. Below the illustration is a statement that reads, "By all definitions, a(n) _____ lowers the pH of aqueous solutions."

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

- Assessment tools utilize visually clear pictures and appropriate graphics for the developmental level of students in the Concept Mastery Section.
  - For example, in the Concept Mastery Nuclear Chemistry Formative Assessment 1, Question 3 contains a picture of a parent nucleus that is split into a particle and a daughter nucleus with a key that represents a proton and neutron, followed by the following question: "In the process pictured, what is the change in mass of the parent nucleus? [C.1G]"
  - In Unit 4, Lesson 1, assessment of ionic bonding and periodic properties, the first question asks students to determine which set of elements will bond with the least amount of electrostatic attraction. Provided with this question is a color-coded periodic table to show the electronegativity trend. Not only is the question asking students to use a model to figure out the correct response, but the image also helps students to access the information they learned by using a visual prompt.
- Assessment tools utilize visually clear pictures and appropriate graphics for the developmental level of students in the Vocabulary Check Section.
  - For example, in Unit 7, Vocabulary Check, the fourth question has three images of two gas particles colliding. The first image has two gas particles heading towards each other labeled "Before Collision," the second image has the same two particles colliding labeled "Collision," and the last image has the same two particles moving away from each other labeled "After Collision." The image is there to help students choose the correct answer that, according to the kinetic molecular theory, elastic collisions between particles transfer kinetic energy from one particle to another.
  - In the Vocabulary Check section focusing on "Endothermic vs. Exothermic Reactions," the materials present an energy diagram featuring labeled components such as stored chemical energy, reactants, products, energy absorbed, and the direction of the reaction. The materials accurately depict the energy absorbed by the products, which is higher than that of the reactants, for the forward reaction from reactants to products. This precise representation is an appropriate graphic to elucidate the concept of endothermic reactions. The accompanying statement reads as follows: "A(n)____reaction absorbs heat from the environment, making the surrounding area feel cold."

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

- The materials provide guidance for teachers to ensure consistent and accurate administration of the assessment tools in the Assessment Bank Document. The document directs teachers on how to create formative and summative assessments and how to administer these assessments to students. The materials in this document state that the teacher can create a "unique set of items different from the thousands of pre-set formative and summative assessment items already included in all of the lessons and assignments." The materials showcase a helpful visual aid—a picture displaying an arrow—which guides teachers toward the new assessment appearing on the table and ready to be assigned to students. The materials utilize color-coded labels to provide visual cues for teachers, enabling them to identify and group students based on their performance levels. This feature facilitates the implementation of targeted differentiation strategies within the science curriculum. In the Assessment Bank document, the materials state the assessment bank "Allows you to create assessments on demand using content and items student has never seen before on any of the other Concept Mastery TEKS formative practice assessments: Includes all of the STAAR 2.0 item types, allows you to customize the length, the Units or TEKS to include, the number of items, the % of dual-coded items to include, and the item types. Automatically creates class and student level reports."

- The materials provide teachers with guidance on establishing an assessment routine. The Assessment Bank document suggests that students start by taking Formative Assessment 1, then watch the TEKS video(s) for that particular lesson, followed by taking the vocabulary assessment, and finally, taking the second formative assessment. This general outline ensures that teachers follow the same routine throughout the content. This is also mentioned in the Teacher's Guide in a document titled "Concept Mastery." Slide 39 of the document begins discussing Formative Assessments and shows a visual guide of where those can be found in the platform and pinpoints which one to have students start with so that it is consistent among students.

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

- The materials provide a variety of accommodations that allow students to successfully demonstrate mastery of the knowledge and skills learned in class. The Teacher's Guide incorporates an Accommodation Resources document, conveniently accessible through the Accommodations, Accessibility, and Designated Support tab. This comprehensive resource offers guidance for teachers to support diverse learners. The provided resources encompass various accommodations, including access to bilingual dictionaries, reading assistance for short-constructed response items, content and language supports, and spelling assistance. Teachers are informed of the accommodations that the materials provide, including text-to-speech support, a highlighter tool, an answer eliminator tool, a bookmark tool, a notepad tool, a text zoom feature, closed captioning, a digital calculator, and content and language supports. Teachers are also instructed on how to enable designated support for students. Teachers can utilize the Manage tab at the top right of the main page. Within this tab, the Accommodations feature allows teachers to enable Text to Speech support specifically for individual students during assessments. This guidance offers a tailored and inclusive approach for students to demonstrate mastery of learning goals.
- These accommodations are built into the assessments. For example, all assessments include a speaker icon next to each question. This icon allows students with oral accommodations to have individual questions read to them. Also, at the top of each question in the two formative assessments provided with each unit, there is a toolbar with accessibility features. This toolbar includes the highlighter, answer eliminator, bookmark tool, notepad tool, text zoom, digital calculator, reverse contrast capability, braille mode, and text-to-speech tools mentioned in the Teacher's Guide.

Summit K12 Dynamic Chemistry

Indicator 7.1

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Within each unit, there are targeted vertical alignment TEKS with lessons for students who need additional help filling gaps from previous grade levels to learn prior material before continuing their learning with current content. For example, in Unit 6, a lesson named 8.6E, Law of Conservation of Mass, covers balancing equations to help students learn about reaction stoichiometry.
- Furthermore, in Unit 2, scaffolded lessons are provided to support struggling students in their understanding of previous learning TEKS 8.6B, atoms in chemical reactions, and IPC 8C, the prior knowledge of nuclear reactions. Teachers can recognize these scaffolded lessons by an icon provided in the materials. This icon is targeted instruction for the teacher to scaffold learning for those students who have not yet achieved mastery of those TEKS that they need to master the material in this unit. Each scaffold from previous grade levels provides teachers with a lesson guide, EPoster, Formative Assessments, and videos. For example, in the lesson guides dashboard for Unit 4, the teacher can see that the second and fourth lessons are scaffolded from seventh-grade science, as indicated by the scaffolding icon.
- Teachers can find activities dedicated to practicing unit conversions for volume in the lesson guide for Unit 9.3. For example, in the Molarity and Dilutions Reading and Practice section of Lesson 9.3, the materials illustrate a conversion scenario involving the molarity of beakers 1 and 2, utilizing the ratio of moles to volume in liters. Furthermore, the Reading Guide encompasses Molarity Practice problems that provide opportunities for students to practice their skills in converting measurements, whether determining the mass of solute, calculating moles of solute, or working with molarity. Notably, the Reading Guide also incorporates practice problems

centered around concentrated and diluted solutions, effectively addressing these concepts in the Dilution section.

- In the Teach and Discuss section of Unit 9.2, the materials recognize a common challenge for students when attempting to predict reaction products. To address this challenge, the materials introduce the concept of "like repels like," highlighting that ions with the same charge tend not to form new compounds. This notion serves as a foundation for the subsequent activities, which aim to support students in achieving mastery. These activities include the Reactions Reading and Practice, the Precipitation Reactions Investigation, a comparison between Total Ionic Equations and Net Ionic Equations, as well as the exploration of Solubility Arguments. In the "Solubility Arguments" activity, teachers prompt students with writing prompts related to their understanding of solubility rules. This exercise encourages students to articulate their comprehension of these rules and their application. Furthermore, the "Total Ionic Equations Vs. Net Ionic Equations" activity offers an engaging opportunity for teachers to guide students in creating visual notes. This visual approach helps students visually grasp the distinctions between total ionic equations, net ionic equations, and molecular equations, facilitating a deeper understanding of these concepts.

Materials provide enrichment activities for all levels of learners.

- Materials provide enrichment activities for all levels of learners. The lesson guide provides various enrichment opportunities for learners at different levels to extend their skills beyond the expected grade levels throughout the lessons. For example, in Unit 1, Lesson 1.3, students design, test, and evaluate a device to measure their lab table accurately. Also, in this lesson, students use science and engineering practices to create a recipe for slime to earn money for homecoming. Projects are not labeled as enrichment activities.
- In addition, in Unit 4, in the Apply and Extend section of the Lesson 1 guide, the following teacher guidance is provided: "Students will use electronegativity values to predict bond strength." This activity, "Predicting Strength of Ionic Bonds," is an optional enrichment activity meant for students to utilize what they have already learned to better understand how electronegativity can be used to determine the strength of a bond created between two elements. In Unit 4, Lesson 2, there are two more extension activities as well, a practice with ionic bonding and an investigation in which students physically combine chemical compounds, observe chemical reactions, write/name new ionic compounds formed, and then create a written justification for their claim that ionic compounds were created. This investigation activity specifically appeals to different learning styles, which would be useful for all learners to solidify their understanding of ionic bonding and nomenclature.
- Also, in Unit 6, Lesson Guide 6.2, The Mole, Avogadro's Number, and Mole Conversions, within the Apply and Extend section, there are three additional activities to further students' learning. Two practice activities take the calculations of moles and apply them to the real world and a project about Mole Day.
- Finally, in Unit 10.3's lesson guide, there is a wide range of activities available, including the "Making Your Indicator Investigation," the "pH-Ion Concentration Virtual Lab," the "pH and Calculations Coloring Activity," the "pH-Acids and Bases" exploration, the "pH Calculation Task Cards" Activity, and the "Create A Campus Green Space Engineering Project." Materials explicitly address how learners can expand their skills in those activities with SEP standards and learning goals. Additionally, enrichment activities in Chapters 10.1 and 10.2 cover topics on types of acids and bases or neutralization reactions.

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

- Materials provide just-in-time acceleration as well as scaffolded instruction. An example of this can be seen in Unit 7, Lesson 7.2, in the Apply and Extend section with the activity labeled “Algebra Help.” In the Algebra Help activity, guidance states, “Use this guide to differentiate for students who need additional help manipulating algebraic equations. Students will walk through guided examples using the gas laws before completing practice problems without numbers.” Another example of this acceleration and scaffolded instruction is seen in Unit 6, Lesson Guide 6.3, in the Teach and Discuss section, with the activity “Mass Conservation Basics,” where students learn about why reactions must be balanced as well as practice identifying balanced reactions.
- The Teacher's Guide is valuable for teachers, providing general guidance through a “Differentiated Teaching and Learning” document in the Differentiation and Acceleration tab. This guidance primarily focuses on differentiation, as it emphasizes the inclusion of embedded vertically aligned scaffolded content that is approximately one to two grade levels below the current level of instruction for some on-level units. To illustrate, let's consider Unit 10.1, which aims to define acids and bases and enables students to apply their understanding of their properties. In line with this goal, the materials include a lower-grade level scaffolding lesson called “Properties of Acids and Bases.” This lesson allows teachers to provide additional support for students who may require a more gradual progression toward mastering the key concepts.
- Also, in Unit 2, the average atomic mass activity includes an extension to calculate percent abundance based on average and individual atomic masses. The extension states, “What if the average mass is known and the mass of each isotope is known but not their percent abundance? Use algebra to determine the abundance of each isotope present. Let's go back to apples and oranges. A crate of mixed fruit (apples and oranges) is delivered. There are 200 pieces of fruit with an average mass of 0.30 lbs. Without opening it, how many of each type of fruit is present? Logically, there are more apples than oranges since the average is closer to the mass of the apples. But how to figure out an exact amount?” This extension provides just-in-time learning acceleration for students ready to take the next step in the average atomic mass process. In addition to the extension in this lesson, the materials also provide videos that can be used for just-in-time learning for struggling students. Each lesson guide contains a TEKS video that covers the same content using a different format with explanations, images, and questions that check student understanding. For example, teachers can have struggling students watch the TEKS video “Isotopes and Their Mass” to help clarify and support just-in-time learning for the concepts presented in Lesson 2.2 about Isotopes and Average Atomic Mass.
- In addition, teacher tips can also be found in the lesson guides of each unit. Some activities come with guiding questions that the teacher can ask leading students through that portion of the lesson. However, these guiding questions are not used as a scaffolding tool when students are struggling; they are used as guiding questions. For example, in Unit 4, Lesson 2, in the “Literacy Connection- Using Subscripts to Make Ionic Compounds” segment, students work in pairs to complete the activity and explain why subscripts are important. The following question is provided along with an exemplar answer, “When cations and anions combine to form compounds, why are subscripts important? How do you determine what they should be?” These are guiding questions, not questions meant to break the content down further.

Indicator 7.2

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- The materials incorporate a variety of developmentally appropriate instructional approaches to cater to diverse learning needs. Each unit's lesson guide offers a variety of engaging activities such as classroom demonstrations, virtual labs, investigations utilizing lab equipment for data collection and measurement, video clips to reinforce science concepts, and collaborative engineering projects that relate to real-world problems. For example, Unit 2 contains multiple instructional strategies, including independent work, a choice board, a teacher demo, and a lab investigation. In Lesson 2.1, there is an article on the history of the model of the atom for students to read and a graphic organizer for students to fill out independently. In Lesson 2.2, teachers do a teacher demo; students have a choice board to work on independently and a lab investigation of working on with a group. There are also TEKS videos for teachers to use with students, as well as PowerPoint presentations to use with the whole class.
- Materials are presented in a 5E instructional sequence to authentically develop engagement in learning all topics. For example, in Unit 4, Lesson 1, the lesson guide begins with an “Engage”

activity that relates the content of the chapter to the students' lives, providing a real-world connection. Students then view an animation demonstrating how ionic bonds form. From this animation, students describe the formation of an ionic bond and share it with a partner.
- Also, in Unit 6, Lesson Guide 6.3, Reaction Types and Balancing Equations, students begin the lesson with an age-appropriate investigation to engage them with the lesson using baggies and everyday chemicals. Students then engage in a debate between scientific theory and law. Next, there is a worksheet with developmentally appropriate models of atoms to help students balance reactions. The next step in the lesson guide is for students to take their knowledge from the balancing worksheet to writing and to balance reactions from sentences.
- Finally, in Unit 10.2, students explore the "Effect of Acid or Base Strength on pH and Conductivity Virtual Lab." This virtual lab allows students to develop explanations of the relationship between acid or base strength and pH. Additionally, students can reinforce their knowledge of acid-base reactions by watching the "Strong Acid/Strong Base Neutralization Reaction Video." This video clip serves as a visual aid to enhance their comprehension and solidify their understanding of the topic. To further develop their skills, students engage in a hands-on investigation of titration with the "Titration of an Acid and a Base" activity. This activity allows students to apply their knowledge and practice the skill of titration, a fundamental technique used in chemistry. By incorporating these diverse instructional approaches, the materials provide students with multiple avenues to explore and understand key concepts.

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

- Materials consistently support flexible grouping. In the Teacher's Guide, the Instructional Strategies for Flexible Grouping document guides teachers in flexible grouping strategies. The materials suggest that guided practice is appropriate for novel content and suggest teachers have students check with an elbow partner as an appropriate grouping strategy. Materials also suggest teachers may also use small group methods to work with students. Individual whiteboards or desks with dry-erase markers are helpful tools for expressing ideas in one-on-one or two-/three-on-one situations. As students become confident in their abilities, they can move to more independent levels of practice. For labs, class discussions should focus on the results of the lab. Finally, the materials suggest collaborative practice can be helpful when students are struggling to understand the material. All of these strategies suggested by the materials allow flexibility for the teacher in grouping students.

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

- The materials offer multiple types of practices with comprehensive guidance for the entire lesson to ensure successful implementation. Each activity has defined learning objectives and precise instructions. Furthermore, the materials equip educators with insights into various instructional methodologies, including guided practice, individualized support, autonomous practice, and collaborative engagement, all aimed at enriching the teaching process. For instance, consider the "Examples of Laws of Thermodynamics" exercise in Lesson Guide 8.1, where the materials go a step further. The answer key for this exercise includes a teacher's note positioned on the first page of the document. In this note, the materials suggest an effective strategy: implementing peer-to-peer editing. The recommendation is for students to scrutinize and respond to their peers' written explanations and drawings. The suggestion is to form pairs or groups of four students. Subsequently, each student exchanges their examples with another student and then provides feedback using sticky notes. Furthermore, the materials suggest that teachers prompt students to search for supporting evidence within the text that elucidates the given example. Additionally, when students work in a group of four, each member could examine the same example provided by three of their peers.

- All lessons include PowerPoint for whole-group instruction and TEKS videos for individual instruction. Collaborative practices such as turns and talks and independent practices are also embedded in lessons. For example, in Unit 2, Lesson 2.3 has a PowerPoint for the material, a TEKS video, a turn and talk for the uses of nuclear power activity, and independent practice where students create a Venn diagram comparing fission and fusion. In Unit 5, Lesson 3, students complete an investigation ("Investigating and Comparing Properties of Ionic and Covalent Compounds") where they determine if compounds are ionic or covalent based on physical properties.
- Furthermore, in Unit 6, Lesson Guide 6.3, Reaction Types and Balancing Equations, a collaborative approach is taken for collecting data in the Conservation of Mass Investigation. Then a class discussion is held to analyze the results.

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

- The materials include diversity in the images of specific scientists that have made historical contributions to chemistry. For example:
  - Chemistry Videos 1.2 Accuracy and Precision, 2.3 Nuclear Chemistry, and the scaffolding lesson IPC 8.C all have diverse representations, including different genders, races, and ethnicities represented.
  - Also, in Unit 3, Lesson 3.1, in the activity "Women of the Periodic Table," students read an article about how women's scientific accomplishments have been omitted from history and then research female scientists who discovered elements on the periodic table.
  - There is a diversity of temperature scales in Lesson Guide 7.1, which presents students with an activity, "Relevance of Scales," which has students convert from Fahrenheit to Celcius to Kelvin, representing the importance of converting measurements from Fahrenheit to Celcius, and provide information or images of people and places.
- The materials offer projects that address the topic of diverse societies; For instance, in Lesson Guide 8.2, teachers can introduce the research project "Is Older Better," which allows students to explore the history of long-lasting Roman concrete, as well as an activity in Lesson 2.1 in which students conduct research on the scientists that are responsible for the different models of the atom throughout history. Last but not least, the materials provide an up-to-date note about Gilbert Lewis in the form of a Teacher's note in Lesson Guide 5.2.

Summit K12 Dynamic 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.	M
2	Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English.	M

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials include guidance for linguistic accommodations (communicated, sequenced, and scaffolded) commensurate with various levels of English language proficiency as defined by the English Language Proficiency Standards (ELPS). For example, in Unit 3, Lesson 3.1, "Teachers should monitor students' oral language production and encourage self-corrective techniques. Teachers can ask students to verbalize different sounds, repeat or rephrase words, and ask students to repeat what they heard. Students will use learning strategies by comparing pronunciation with peers and offering synonyms or related words. Turn-and-talk activities offer students linguistic support to enhance their understanding. Students will demonstrate expanded vocabulary as they communicate with classmates."
- Also, in Unit 6, Stoichiometry, Lesson Guide 6.1, The Math of Chemistry, three activities list the ELPS covered by what is provided. In the literacy connection section of this lesson guide called Using Calculations in Chemistry, students record the heights of the entire class and then evaluate the data and make connections. The ELPS listed are 3.D.i, 3.D.ii, and 3.E.i.
- The instructional materials include suggestions for linguistic accommodations at crucial junctures within the main lessons. The Literacy Connection activities in each lesson guide include the ELPS. For instance, in the Real World Connection to Specific Heat of the Lesson Guide 8.3, materials recommend that teachers actively monitor students' understanding of spoken language. Materials also include the [ELPS] (1.A.i)(1.A.ii)(2.D.i)(2.D.ii). Additionally, the materials offer guidance for teachers to encourage students to utilize sentence stems as a

scaffold for their responses. These sentence stems, such as "I notice that the materials with lower specific heats feel...than the materials with higher specific heats. I think that means that...," help students structure their thoughts and articulate their observations. Furthermore, the materials suggest that teachers guide students to employ content-specific vocabulary when formulating their statements. Another example is the Vocabulary Development Model teachers can provide students with the Graphic Organizers tab that can support students in learning new terms.

- Finally, the materials include guidance for linguistic accommodations within an ELPS support document found in the Teacher Resources section of the online platform. Within this document, for each ELPS, there is teacher guidance on how to accommodate the standard within the curriculum context and student guidance that provides recommendations and strategies for mastery of content, as well as a suggested activity. For example, the first suggested activity recommends that students explain in writing and sketch a text segment covering a specific concept. Afterward, they switch with a partner and discuss their thinking and the outcomes.

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

- Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English. The student guide provides suggestions for students reading a new language. Students are encouraged to use their first language and tools such as glossaries, bilingual dictionaries, and definition lists to assist with academic development. Materials include a K12 ELPS support document covering the ELPS with a section for teacher guide and student guide. The ELPS guide has a teacher guide and a student guide for the specific ELPS.

- The ELPS support document includes the following guidance for the strategic use of a student's first language; the "student guide" section explains that emergent bilinguals (EBs) will not know all of the different words that teachers say and that they can get clarification by asking the teacher where they can find a dictionary that defines those difficult terms in either their native language or in simple English. Also, under "Student Guide," it states, "You might get the materials you need to read in both English and your first language." In the "Science Literacy Vocabulary Mastery Button," there are "practice vocabulary" activities for students to give students a variety of terms for students to assess their knowledge by choosing a term from the missing definition. Students can click on the vocabulary cards, and the card turns over to reveal more of the definition. The feature has the term in both English and Spanish and provides a text-to-speech that clearly states the English pronunciation for the student.

- In Unit 6, Stoichiometry, Lesson Guide 6.3, under Literacy Connection, Mass Conservation Basics, in the gray box under Apply and Extend, the key for this activity provides specific teacher guidance on including students' first language as they learn English. Teachers are offered guidance on having students take notes and define any new vocabulary terms in their journals or materials. Teachers can provide Frayer Model templates where students can record these terms, draw illustrations, and identify examples to internalize their meaning. After reading, students identify key details and respond to questions. They may also compare notes and responses with a partner.

- Finally, the Teacher's Guide includes an Accommodation Resources document, conveniently accessible through the Accommodations, Accessibility, and Designated Support tab. This document provides a comprehensive compilation of available resources. These resources encompass a range of accommodations, including bilingual dictionaries, reading assistance for short-constructed response items, content and language supports, and spelling assistance. However, the Accommodation Resources document does not show how to access information and utilize these accommodation features to encourage the strategic use of students' first language.

Summit K12 Dynamic Chemistry

Indicator 7.4

Materials provide guidance on fostering connections between home and school.

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials provide information to be shared with students and caregivers about the design of the program. Materials include in the Teacher's Guide, under Additional Resources, Parent/Guardian Letters that teachers can click on to access parent/guardian materials examples. Here, there are parent/guardian example letters teachers can send home "to introduce parent/caregivers to the [program] K12 Science resources." The parent/guardian materials state, "The [program] K12 program is web-based, so students can access it from any computer or tablet with an internet connection. Results from student study sessions are recorded and made available to teachers, including results from sessions completed at home." This letter includes valuable resources to initiate conversations at home, covering key points, conversation starters, activities, vocabulary, and picture talk prompts for all sections.

- In this same location of the teacher's guide under Additional Resources, "Students Getting Started," is information to be shared with students about the design of the program. These materials take the student through all aspects of the program, from Chemistry Interactives and Videos to Scientific Engineering Practices. Additionally, the "Student Dynamic Chemistry Orientation Guide" found under the "Student - Getting Started" tab provides a comprehensive overview of how the program is structured and the different components of the course. Students can also access the "Support" tab on the top right of the page, which provides general student support in English and Spanish through the "Using K12 Students" section. This website provides resources such as a student guide for online tools, getting started tips, and understanding personalized learning plans (PLPs). Furthermore, materials provide additional embedded documents under the “Additional Resources” tab in the teacher’s guide. In addition, materials support the home-to-school connection by providing a letter to caregivers under the “Home to School Connection” tab. This letter includes valuable resources to initiate conversations at home, covering key points, conversation starters, activities, vocabulary, and picture talk prompts for all sections. Overall, the materials aim to support students and caregivers by providing comprehensive resources and guidance to enhance understanding and engagement with the program.

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

- Materials provide information to be shared with caregivers for how they can help reinforce student learning and development. The materials contain a “Home to School Connection” section in the Teacher’s Guide under Additional Resources. The materials state, “Dear Caregivers, Below are some resources to start conversations at home. Remember to log in to [program] K12 to view TEKS videos, quizzes, vocabulary boosters, and more!” Every lesson in the curriculum has key points, conversations, activities, vocabulary, and picture talk. For example, in Lesson 1.1, one of the key points listed is “Safety rules are critical to a productive year in chemistry for everyone.” One of the questions under conversations is, “Are there any safety issues around our home? Are chemicals stored properly?” An activity listed is “Do a safety audit of your house using the rules for chemistry lab.” The vocabulary listed is eyewash station, fire extinguisher, fire blanket, fume hood, goggles, Safety Data Sheets (SDS), safety equipment, safety shower, and waft. For picture talk, several safety pictures would be on labels, and the question is, “What do these common pictograms mean?” All of these in the materials help caregivers reinforce safety, which students learn in Lesson 1.1.
- In Unit 5, Lesson 2, students also study molecular geometry; single, double, and triple bonds; and Lewis Structures. The Home-School Connection provides caregivers a summary of key points, questions to ask the students, some activities such as creating Lewis structures using marshmallows and toothpicks, and images, all to help support and reinforce what students are learning.
- Furthermore, in the Home to School Connection for 6.4, Stoichiometric Conversions, the first sample conversation is about how the amount of ingredients you have in your kitchen can affect how much dinner you can make. It prompts, “How many pancakes can we make with all the eggs in the refrigerator right now?” This prompt helps caregivers to make that real-world connection of stoichiometry in chemistry.
- Moreover, in Lesson 10.1, materials provide key points such as the characteristics of acids and bases. Caregivers can engage their child in interactive conversations and activities, such as discussing the taste of different foods and drinks to identify whether they are acidic or basic or categorizing household items based on their acidity or alkalinity. By providing caregivers with this information and support, materials foster a collaborative learning environment that extends beyond the classroom and empowers caregivers to play an active role in their child’s education.
- Another feature providing information to be shared with caregivers is the “Report” tab in the drop-down menu. Materials offer a personalized usage report that provides insights into the student’s progress and engagement with the program. This report includes details about the student’s school, teacher, class, and timeline, giving caregivers a comprehensive overview of

their child's participation. The usage report also includes information on the quizzes completed by the student, offering valuable insights into their performance. This data enables caregivers to understand their child's progress and level of involvement in the program, helping them to provide targeted support and assistance. Additionally, there is an option to download the usage report from the website. This feature enables teachers to share their students' learning progress.

Materials include information to guide teacher communications with caregivers.

- Materials include a "Parent/Guardian Letter" in the "Teacher's Guide" that includes information to guide teacher communications with caregivers. The instructions state, "The attached letter is an example of one that you may send home to the parents or caregivers of your students to introduce them to the [program] K12 Science resources. We suggest sending the letter below, as well as instructions for how to access the program from home, through the district's LMS or portal." In addition, the "Parent/Guardian Letter" provides information for teachers to share with caregivers, like "This online program is accessible from home and includes lesson videos, digital flashcards, study guides, animations, and assessments." Furthermore, the letter explains to caregivers how "students will most likely be assigned work in one of the following modules:
    - Science Videos and Simulations – Lesson videos for all of the TEKS
    - Concept Mastery – Lessons, assessments, vocabulary, and practice to help students master each TEKS during the year
    - Science Literacy and Vocabulary Mastery – A TEKS-based nonfiction literacy and vocabulary resource to help students master Science vocabulary and concepts
    - Scientific and Engineering Practices – Includes Science labs, field investigation videos, more advanced vocabulary flashcards, Science process skill lessons, and other inquiry-focused resources."
- The letter engages caregivers as partners in learning as it encourages caregivers to "Feel free to explore these areas with your child as they begin to use the Dynamic Science course from home. Your child's teacher will guide the areas the students should work on each week. We look forward to helping your student reach their full potential in Science this year!"
- The "Home to School Connection" letters in the "Teacher's Guide" include information to guide teacher communication about current learning objectives and invite ongoing communication and partnership between teachers and caregivers.
    - For example, in Lesson 3.2, the materials state, "Dear Caregivers, Below are some resources to start conversations at home. Remember to login to [program] K12 to view TEKS videos, quizzes, vocabulary boosters, and more!" In this part of the materials, there is information for the caregivers on how to support their students in the lesson on isotopes and average atomic mass.
    - Additionally, in Lesson 1.1, one of the key points listed in the Home to School Connection is "Safety rules are critical to a productive year in chemistry for everyone." One of the questions under conversations is, "Are there any safety issues around our home? Are chemicals stored properly?" An activity listed is "Do a safety audit of your

house using the rules for chemistry lab.” The vocabulary listed is eyewash station, fire extinguisher, fire blanket, fume hood, goggles, Safety Data Sheets (SDS), safety equipment, safety shower, and waft. For picture talk, there are several different safety pictures that would be on labels, and the question is, “What do these common pictograms mean?” All of these in the materials help caregivers reinforce safety which is what students learn in Lesson 1.1.

Summit K12 Dynamic Chemistry

Indicator 8.1

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- In Teacher's Resources, the teacher's guide includes a year-long scope and sequence along with pacing guides. For example, the "Year-At-A-Glance" within the scope and sequence document lists the order of TEKS C.1C -E, C.1G, C.2B, and C.2C taught in Unit 1.
- The teacher resource pages have units laid out in the order intended by the publisher. For example, Unit 1 is Introduction to Chemistry, Unit 2 is Atomic Structure, and so on. In the Scope and Sequence document located in the Teacher Resources, teachers can view a scope and sequence that provides a Year-at-a-Glance (YAG) pacing guide, as well as the TEKS covered in each unit. Additionally, this document lists the different lessons in their appropriate order, the TEKS that each lesson covers, and the number of days needed per lesson and unit.

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

- The materials provide explicit opportunities for students to make connections to core concepts and science and engineering practices (SEPs). For example, The TEKS-SEPs-RTCs Crosswalks explicitly provide a year-long plan for connecting SEPs and concepts in each unit for the year. This plan helps guide the teacher to identify the SEPs that accompany each student's expectations and also shows how often those SEPs and student expectations are touched upon within the curriculum.
- The materials provide teacher guidance and clarity in understanding how activities and experiences connect concepts and SEPS. For example, in the lesson guide from Unit 2, Lesson 4,

students complete a demonstration/investigation of the emission spectra. There is a section of text that provides "Teacher guidance for facilitating connections." The guidance points out possible areas where students may struggle and provides ideas on how the teacher can help students avoid these struggles. In the Unit 3 Lesson 1 guide, when students are completing a periodic table reasoning activity, teachers are advised that students may "need help noticing that there are both vertical and horizontal repeating patterns" on the periodic table and that the teacher may need to lead a whole class discussion of organizing data into tables and discuss limitations of their model.

- In each unit, teachers access and connect SEPs to content in lesson guides. For example, in Unit 6, the stoichiometry lesson on the mole and Avogadro's number with mole conversions, the Engage activity lists what SEPs students connect to the content though there is limited teacher guidance on facilitating the SEP connection. Additionally, in a Unit 3 activity, the teacher puts students in the role of early scientists and asks them to create a periodic table layout based on elemental characteristics, which encourages students to use the science and engineering practice of organizing data, though there is limited guidance for teachers on facilitating the connection to SEPs.

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

- Materials provide opportunities for review and practice of knowledge and skills spiraled throughout the year to support mastery and retention. For example, the study guide included in each unit, as well as formative assessments found in the teacher resources, utilize the natural progression and scaffolding of the content.
- The scope and sequence document provides suggestions and time for review and practice of knowledge and skills spiraled throughout the year to support mastery and retention. For example, the scope and sequence reads that it "was designed to be flexible, with extra time built in for concept and spiral review, in-depth discussions and investigations, and extension activities to support learners of all abilities. It can be adapted for teaching the TEKS in any preferred order or according to a district-provided Scope and Sequence." Underneath there is a table that provides suggestions for spiraling in review for most units. For example, during Unit 4: Ionic Bonding, the spiraling suggestion is "Periodic properties, safety, tools, and measurement."
- The Concept Mastery component provides a list of different activities that students can review and practice to support mastery of the current unit TEKS. For example, students can use videos to review concepts, objectives, and relevant examples of each unit before completing the formative assessments. Each unit located in Chemistry Videos and Interactives provides a suggested lesson sequence using unit numbers and TEKS.

Summit K12 Dynamic Chemistry

Indicator 8.2

Materials include classroom implementation support for teachers and administrators.

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

Partial Meets | Score 1/2

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

Materials provide teacher guidance and recommendations for use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning. Materials include some standard correlations but do not include cross-content standards that explain the standards within the context of the course. Materials include a comprehensive list of all equipment and supplies needed to support instructional activities. Materials include guidance for safety practices, including the course-appropriate use of safety equipment during investigations.

Evidence includes but is not limited to:

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

- Materials provide teacher guidance and recommendations for the use of all materials, including text, embedded technology, enrichment activities, research-based instructional strategies, and scaffolds to support and enhance student learning. The materials include overview documents that provide teacher guidance on scaffolding, technology, and lesson activities. The materials offer ELPS (English Language Proficiency Standards) and 5E (Engage, Explore, Explain, Elaborate, Evaluate) guidance, incorporating research-based instructional strategies. The lesson guides are structured according to the 5E Model, organizing activities from the Engage to Evaluate levels. Each activity within the lesson guide provides detailed instructions for teachers on how to facilitate the activity effectively. For instance, in lesson guide 9.1, the materials include a teacher guide that encourages students to connect the sugar cube activity with their prior knowledge, utilizing vocabulary and explanations from Lesson 5.3. This connection helps to reinforce the concepts learned in a meaningful way.
- For example, the materials contain a dynamic course overview that guides teachers on how to use all materials. This guide has graphics showing where each material is located and what the

material entails. The teacher's guide provides guidance for embedded technology, such as interactives, videos, and simulations. The guide also provides guidance for differentiation and scaffolding. Graphic organizers are included in teacher materials, but no guidance is included on research-based instructional strategies to facilitate these learning experiences. Furthermore, the teacher's guide section labeled “Teacher: Getting Started” guides teachers on how to start a lesson by suggesting where teachers begin to familiarize themselves with the platform and also helps teachers get their classes set up, though materials provide little guidance on instructional strategies for the lessons.

- In the teacher's resources section, under the Videos and Interactives heading, there is guidance on using embedded videos and interactive electronic resources. Additionally, on some of the graphics, the TEKS are embedded on the graphic so that the teacher focuses on the correct content.
- The materials are organized to help teachers facilitate different lessons and units; however, they lack guidance on methods of lesson implementation. For example, the materials include a scope and sequence pacing guide with a number of lessons to support teachers in understanding which part of the site to use throughout each lesson; however, there is little guidance within these documents for recommendations on how to use these components during the lesson. The lesson guide found in the teacher resources contains an icon that indicates when a particular lesson contains concepts that have previously been taught. The lesson guide provides guidance on how each linked resource (e-posters, PowerPoint, and study guide) is used. Additionally, this includes text, embedded links for handouts, and recommendations to enhance student's learning in the core concepts.

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

- The materials include standard correlations for lessons found in teacher guidance documents but do not have specific cross-content standards listed or working links.
- All lesson guides for each unit include standards correlated to the TEKS and ELPS but do not include cross-content standards. However, in the materials, teachers have access to cross-curricular correlations at the beginning of the lesson guides for each lesson. For example, Unit 4 lists which literacy connections are listed in the unit, but specific cross-content standards are not listed or explained within the context of the course. For example, Unit 10, Lesson 10.3, over acids and bases, states the literacy connection is "What is Ph? Reading and Practice”; however, there is no TEKS listed or any explanation given on how this connects. Additionally, in the lesson guide for 4.1 on Ionic Bonding and Properties, there is a section with a literacy connection with reading about the content. In the teacher resources, there is information for implementing ELPs within the science classroom.
- In the lesson guide, found in the teacher's resources, there is no mention of cross-content standards, nor is there a description of how those standards fit within the context of the course. However, the TEKS are represented and explained within the course. Another example includes a document labeled “Science Literacy-Vocabulary Mastery,” which has inactive links to show the cross-content ELA standards. Therefore, there isn't access to content standard correlations or explanations.
- The dynamic chemistry teacher guide also has embedded links which include TEKS-SEPs-RTCs crosswalk, scope and sequence, and pacing guides; however, only the TEKS and ELPS can be accessed on the main website.

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

- Materials include a comprehensive list of all equipment and supplies needed to support instructional activities within the specific lesson guides in the course. For example, there are comprehensive material lists with links that can be accessed to all equipment and supplies needed to support lab activities. For example, the Chapter 1.1 lab investigation, "Acid on Skin Investigation," requires a volumetric flask, 100 mL graduated cylinder, 250 mL beaker, funnel, etc.
- Furthermore, each lesson guide provides a detailed explanation of the 5E lesson component and provides print materials for teachers to use in planning lessons as well as all materials needed. For example, in Unit 7.1, "Kinetic Molecular Theory and Dalton's Law," the lesson guide suggests an "investigation—Popcorn and water molecules of phase changes" activity for the Engage activity. The teacher notes also provide a full list of materials for this example, which include popcorn kernels, a box of butter, Dixie cups, two hot plates, etc.

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

- Although materials provide teachers with some resources to use for safety practices which include safety equipment, videos, and PowerPoint, they do not provide specific safety guidance in investigations. For example, a lab safety agreement in the teacher resource section can be used as a reference for safe lab practices; however, it does not directly explain how to use lab safety equipment for each lab. Unit 1 contains a PowerPoint that details lab safety equipment and how to use it.
- Additionally, the materials offer safety protocols for the laboratory in each lesson, providing teachers with guidance on safety during investigations and activities. For instance, in section 1.1's "Acid on Skin Investigations" lab, the materials outline safety procedures for students and teachers. These procedures include the use of safety goggles, instructions on handling pH strips, and guidelines for rinsing glassware. Moreover, the materials incorporate safety practices to be followed during experiments, as well as a clean-up procedure to be carried out after the investigation.
- In the materials, teachers have access to some safety guidance by use of a PowerPoint in the scientific and engineering practices section, under safety and tools, but materials do not include guidance for teachers on the preparation of chemicals. For example, in Unit 1, Lesson 1.1, the teacher can access a PowerPoint on safety rules, and they have access to a video for safety in the chemistry videos. Additionally, Unit 9, Lesson 9.1, Types of Solutions and Rate of Dissolving Investigation, has safety rules at the beginning as pre-lab and a section labeled safety in the lab.
- In the materials, under the materials list, grade-appropriate equipment is listed and used within the lab activities. The materials not only provide a materials list with grade-appropriate equipment for each individual lesson guide but also offer guidance on conducting investigations safely. Furthermore, the materials feature a comprehensive Chemistry Master Materials List, which encompasses the required supplies for the entire year. This list is provided at the beginning and serves as a reference point. Additionally, the materials include detailed information on the names of chemicals used in each lesson and provide instructions on how to handle them. For instance, in Section 8.2, the materials specify the chemicals and types of equipment needed for the "Bubbles Galore" lab, such as 3% hydrogen peroxide and a thermometer.

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Indicator 8.3

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- The materials provide guidance on timing for each unit or lessons and activities and recommendations for different scheduling scenarios, such as block scheduling versus traditional timing. For example, teachers have access to a scope and sequence stating that this material is meant to be flexible for the teacher to teach in order to meet students' needs in the classroom. Page 6 of the scope and sequence shows the time allotments for the units to fit in a year with extra time left over for extensions. Furthermore, materials are based on 50-minute class sessions. The Year at a Glance (YAG) provides the number of days that are recommended for each unit. The scope and sequence provides timing for each lesson within a unit which provides options for scheduling considerations and abilities for teachers to choose what is best for their students with that information. In the scope and sequence, there is a breakdown of each lesson and how many days to spend on that particular TEKS with 50-minute class periods. Materials suggest educators use their professional judgment on which activities to use based on their students' needs, which changes the pacing times.
- The material includes pacing guides for teachers with time listed for each activity in a lesson. There is a column for the estimated amount of time the lessons will take if using all of the materials provided, which is based on 50-minute class periods. In the scope and sequence, there is a breakdown of each lesson and how many days to spend on that particular TEK/activity using the standard 50-minute class period. Furthermore, the material suggests educators use their professional judgment on which activities to use based on their students' needs which change the pacing times. For example, in the scope and sequence, the text reads, “Teachers should choose the activities that best serve their students. It is not expected that every activity in every lesson will be completed.” Materials support scheduling considerations and include guidance

and recommendations on required time for lessons and activities. For example, in the scope and sequence, all activities have the suggested time that students should spend on the apply/extend activities.

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

- The materials provide guidance on the sequence of content that must be taught by providing a scope and sequence, year at a glance, and specific order of units that show an appropriate development of progression for the science content being taught. For example, the materials clearly outline the order of units to ensure students learn about precursor concepts first. The scope and sequence provide guidance about the flexibility of units based on the teacher's assessment of their students' needs.
- The order of the materials according to the scope and sequence document shows a progression that is developmentally appropriate such as moles being introduced before mole conversions. The materials also have students learn about the periodic table before ionic and covalent bonding, which is another example of developmental progression that is strategic to chemistry.
- In the planning guide, the resources found in each unit are presented in a logical progression in which depth and mastery of content are built upon. For example, in Unit 6, the lessons and information are scaffolded in order to build the proper math skills before using them to complete mole calculations. Specifically, the students are first introduced with an overview of the lesson and are provided with context; the students learn the information with resources such as a PowerPoint, followed by practice on simple skills and application of those skills in an investigation.

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

- The materials provide activities and lessons for a full year of instruction. In the material, teachers have access to a scope and sequence, which shows the time allotments for the units to fit in a year with extra time left over for extensions.
- The lesson guide provides various digital and hands-on activities for adjustment. Materials have options for different learning goals. For example, in Unit 3.2, Analyzing Periodic Trends, teachers can provide vocabulary dominoes practice for the whole class or graphing of periodic trends for small group intervention. The material states that teachers use professional judgment and the needs of students to choose the activities best for students in the classroom.
- The materials provide guidance for any adjustment needed for local time and scheduling. For example, in the teacher resources, the scope, sequence, and pacing guide specifically states that only 152 days have been accounted for in the YAG (Year at a Glance). This scheduling was done on purpose to allow teachers flexibility in teaching the content. Furthermore, in each lesson guide, there are several activities where teachers are advised to select activities that will best fit the needs of their students. The pacing guide also specifically states that the scope, sequence, and pacing guide are constructed to allow flexibility for reteaching and spiraled review. Teachers can use their knowledge of their own students to determine if each activity is appropriate, which implies that the activities are flexible and can be added or omitted to fit the schedules of each school.
- Materials provide curriculum for 152 days out of the 180 school days with consideration of extra non-instructional activities such as state testing, field trips, or other interruptions. The pacing guide also mentions that teachers should adjust the instructional timeline according to data and the diverse needs of students.

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Indicator 9.1

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

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

Not Scored

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

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

Evidence includes but is not limited to:

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

- Materials include an appropriate amount of white space and a design that supports and does not distract from student learning. For example, on the Powerpoint for Unit 3, Lesson 3.1, there is an appropriate amount of writing and pictures on each slide for a chemistry student to take notes. Also, in this unit, the E-poster is well organized with pictures and information that supports student learning and engagement by showing a timeline of the development of the periodic table with pictures and descriptions of contributions.
- Formative assessments have only one question on the screen at a time so that students can stay focused on the question they are working to answer.
- The video for Unit 4, over ionic bonding and periodic properties, divides the screen into two boxes, each divided into three rows. Each row represents one example compound. The first box displays the elements that make up the compound, their electronegativities, and the math used to find the difference. The second box shows the difference between the elements and the resulting type of bond. Overall, this divide and logical layout make the content easy to follow for all learners, especially visual learners.

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

- Materials embed age-appropriate pictures and graphics that support student learning and engagement without being visually distracting. For example, Unit 3, Lesson 3.1, includes a TEKS video that uses pictures of scientists, gold, copper, and silver, and a picture of the first periodic table. Additionally, in the vocabulary section of the Concept Mastery section, pictures of the periodic table with the different groups are highlighted.

- The materials include E-posters which provide visuals associated with the content being learned. In Lesson 8.2, the E-poster showcases an energy diagram depicting exothermic and endothermic reactions. The diagram includes labels indicating the activation energy, energy of reactants, energy of products, and energy released. Additionally, the E-poster features illustrations representing specific scenarios under the energy diagram. For example, there may be an illustration of an Erlenmeyer flask containing a pink-colored solution where the arrow of heat points away, indicating an exothermic reaction. Conversely, there may be an illustration of a flask with a blue solution where the arrow points toward it, representing an endothermic reaction. By incorporating these visual elements, the materials provide students with a concrete representation of abstract concepts, facilitating a deeper understanding of the topic.

Materials include digital components that are free of technical errors.

- While most links within the units are free of technical errors, some links do not work. The links in Unit 1, for Lesson 1.4, Significant Figures and Scientific Notations, the lesson guide, PowerPoint, and study guides do not work. Also, in Lesson 1.5, Dimensional Analysis, the lesson guide, PowerPoint, and study guides do not work.
- The materials have various components that are either not yet functional or are missing. For example, in the Teacher's Resources, a document called Assessment Bank displays an illustration showing a button in the Concept Mastery section to allow teachers to create their assessments. This button, however, is not currently present in the concept mastery section. Each formative assessment in Units 6 and 7 has opened quickly without error, making it easy to move between questions. However, links on the Teacher's Guides are not clickable, like the Texas Virtual Science Field Guide Investigations and Science Literacy links are not clickable links as they should be.
- The digital components within the materials may occasionally encounter technical errors. The Accommodation Resources document covers many accommodations, supporting students with diverse needs. The resources include bilingual dictionaries, reading assistance for short-constructed response items, content and language supports, and spelling assistance. However, the Accommodation Resources document does not show how to access information and utilize these accommodation features. Additionally, the Accommodation Resources document references the availability of designated support features for students, such as Text to Speech and Content and Language Support. However, in the Manage tab at the top right of the main page, teachers can only access the Accommodations tab, which allows them to enable Text-to-Speech support for individual students. Unfortunately, there is no visibility or provision for accessing the Content and Language Support function.

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.

- Materials integrate digital technology and tools that support student learning and engagement through Chemistry Interactives, Videos, PhET simulations, and interactive E-posters for each lesson. For example, in Unit 1, Lesson 1.3, the materials integrate a chemistry interactive virtual density lab. The materials state, “Students will navigate to Chemistry Interactives and implement an investigative procedure to determine the density of several materials by collecting data.”
- In Unit 5, Lesson 2, students also study the VSEPR theory, Lewis structures, and covalent compounds. One of the activities that the students can access is a PhET simulation to investigate molecular shape, geometry, and bond angles. This simulation is an online program where students can build virtual three-dimensional models of molecules.
- Moreover, in Unit 7, Behavior of Gases, Lesson Guide 7.2, Relationships Between Variables of a Gas, students can explore the various gas laws and their relationships between variables by using gas law animations. There are four animations to demonstrate the four gas laws, and each one is a clickable link that has a short video demonstrating with animations how the gas law works. For example, when you click on the one labeled “Avogadro's Law,” it shows a tank blowing up a balloon with gas particles demonstrating that the more particles you pump into the balloon, the larger the volume gets, which is the learning purpose of the animation.

- Furthermore, each unit includes interactive E-posters, which allow students to delve deeper into the content by zooming in on each part of the poster simply by clicking. This feature promotes interactive exploration and enhances understanding.

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

- The materials include virtual labs that combine science and engineering practices (SEPs) with course-specific content to support student engagement. For example, in Unit 1, Lesson 1.3, the Chemistry Interactive virtual Density lab covers content and SEPs. Students navigate to Chemistry Interactives and implement an investigative procedure to determine the density of several materials by collecting data. SEPs covered are [SEP C.1D] Use Appropriate Tools.
- Additionally, in Unit 5, Lesson 2, students are studying the VSEPR theory, Lewis structures, and covalent compounds, and one of the activities that the students use is a PhET simulation to investigate molecular shape, geometry, and bond angles. This simulation is an online program where students can build virtual three-dimensional models of molecules. This particular PhET simulation activity covers SEP C.1G - develop and use models, and C.2A- identify advantages and limitations of models.
- Moreover, in Unit 6, Stoichiometry, Lesson Guide 6.4, Stoichiometric Conversions, there is a virtual lab named Investigating Sandwiches. Students use a PhET simulation to explore the relative amounts of ingredients to make sandwiches. This lab supports the course-specific content of TEK C9.D- Describe the concept of limiting reactants, but also the SEPs C.1G- Develop and Use Models, C.2B- Analyze Data by Identifying Patterns, and C.2C- Use Mathematical Calculations.

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

- While the materials allow students to collaborate and their teacher in class, they do not integrate digital technology into that collaborative process. For example, in Unit 2, Lesson 2.3, materials say, "Students will investigate, individually or in a small group, common uses of nuclear chemistry in real life and present their findings in a symposium format." The design of this project allows for face-to-face collaboration but does not provide a digital resource to facilitate the collaboration. All digital-based activities, such as PhET labs or digital assessments, are solely meant for a single electronic device and do not have a communication platform built in, indicating no collaboration.
- Through the automatic grading feature, the materials offer immediate feedback to students in the form of grades within the grading platform. However helpful this may be, this feature is still not allowing for collaboration between teacher and student digitally since there is no feature to leave comments or feedback from the teacher and no way for students to respond or ask questions.

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

- Materials integrate digital technology that is compatible with a variety of learning management systems (LMS). The teacher can access information about the compatibility of the materials by going to the Support button at the very top of the program. According to the Support materials under Onboarding & Integration and Technical Specifications, the materials work on all major platforms, including iPads, laptops, PCs, Macbooks, and Chromebooks. The materials state, "[Program] K12 provides an online supplemental curriculum that is 100% web-based (HTML5) and requires no special software installations." It is worth noting, however, that while Android Tablets and Phones can access the LMS through a web browser, these devices do not fully support all features. The article also outlines the minimum system requirements for each platform. For instance, the suggested operating systems include Windows XP, Vista, 7, 8, and 10/11 for PC and OS X 10.4+ for Macs.

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Indicator 9.3

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

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

Not Scored

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

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

Evidence includes but is not limited to:

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

- The materials incorporate videos into their online platform that are developmentally appropriate for the course and align with the scope and approach to science knowledge and skills progression. For example, in Unit 2, Lesson 2.2, Isotopes and Their Mass (C.6D, C.6B), the TEKS videos are developmentally appropriate for first-year chemistry students, and they are aligned to the scope as it comes after the lesson on the history of the model of the atom and the videos contain the TEKS C.6D Calculate average atomic mass of an element using isotopic composition and C.6B Describe the structure of atoms and ions, including the masses, electrical charges, and locations of the protons and neutrons in the nucleus and electrons in the electron cloud. In another video in Unit 5, Lesson 3, intermolecular forces and metallic bonding are illustrated. The materials use a video to demonstrate the “sea of electrons” model for metallic bonds. This concept is much easier to grasp visually in a moving video than simply by verbal or written means or even by a still visual.
- The materials also incorporate animations and digital labs that are developmentally appropriate for the course and align with the scope and approach to science knowledge and skills progression. For example, in Unit 7, Behavior of Gases Lesson Guide 7.1, Kinetic Molecular Theory and Dalton’s Law, there are two gas law animations built into the lesson guide as well as a digital lab called Virtual Lab: Gases Intro Dalton’s Law Inquiry Lab where students will use a PhET simulation to explore the relationship between pressures of mixtures of gasses. These digital activities align the TEKS C.10A Describe the postulates of the kinetic molecular theory and C.10C Define and apply Dalton’s law of partial pressure.

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

- The materials offer valuable guidance on selecting grade-appropriate resources, effectively incorporating the components into lessons, and assessing student learning through digital means. In the Teacher's Guide, educators can find a Concept Mastery document designed to support students in mastering the Concepts and Academic Vocabulary for each unit lesson, all aligned with the TEKS. This document includes instructions on utilizing TEKS videos, vocabulary practices, and formal assessments for student comprehension. For example, the Content Mastery document guides the teacher on implementing the TEKS video during the Unit of Study after the teacher has given students the Formative Assessment 1.
- Furthermore, the Teacher Resources section organizes all content by Unit of Study and TEKS, facilitating easy navigation and adherence to any specific scope and sequence. In the "Videos and Interactives," found as a link in the "Teacher Resources" document, teachers are provided with guidance on how to use the videos and interactives found embedded within the platform. For example, this document explains that teachers can find the TEKS videos within the "Concept Mastery" page and where to find a list of the different PhET simulations and their lab write-ups within the course. These online simulations and experiments make the content more accessible to all individuals through the limited additional resource requirements needed to complete them.
- The Lesson Guides also provide teachers with guidance specific to each unit. For example, in Unit 7, Behavior of Gases Lesson Guide 7.1, Kinetic Molecular Theory and Dalton's Law of Partial Pressures guides teachers to have students complete the Dalton's Law Animation "to demonstrate how Dalton's law of partial pressure is used to determine the unknown partial pressure of a gas if the total pressure and the partial pressures of all the gasses are known."
- The Teacher's Guide provides additional instructions on effectively utilizing the online assessment tool. For instance, teachers can utilize the assessment bank document to create customized assessments tailored to their students' needs. The guidance includes tips for how teachers can monitor student progress and evaluate the effectiveness of the technology. In the Assessment Bank document, materials provide examples of color labels associated with different performance levels. For instance, students who score within the "Approach" range have a blue color label. Students who excel within the "Master" range have a green color label. Additionally, the materials emphasize the significance of reviewing vertically-aligned scaffolded lessons from lower grade levels in the Differentiation and Acceleration document. These scaffold lessons serve as valuable guidance for teachers to support and enhance student learning in each unit lesson.

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

- The materials provide a Parent/Guardian letter, in both English and Spanish, for a teacher to send home that gives information to parents/caregivers about information including the digital aspects of the materials, including the Science Videos and Simulations, vocabulary, and practice to help students master each TEKS during the year. The letter states, "We encourage you to take advantage of this opportunity by using [program] K12 at home." Not only does this show that parents have access at home digitally, but it also encourages parents and caregivers to actively use the program and all of its technology at home.

- The materials also provide a Home-to-School Connections document. This document lists every lesson's key ideas, conversation activities, and vocabulary. At the top of the document, it states, “Dear Caregivers, Below are some resources to start conversations at home. Remember to log in to [program] K12 to view TEKS videos, quizzes, vocabulary boosters, and more.” This statement indicates that caregivers will have access to everything students have access to; therefore, this document, in conjunction with the “Students Getting Started” document, will provide caregivers with the support they need to assist students in finding and learning the content they need. Within the units, a letter offers guidance and resources for each section, including key points, conversation prompts, and engaging activities. For example, in Lesson 10.1, materials provide caregivers with key points on the characteristics of acids and bases. They can engage their child in interactive conversations and activities, such as discussing the taste of different foods and drinks to identify whether they are acidic or basic or categorizing household items based on their acidity or alkalinity. In addition, materials provide caregivers with essential information on how they can support and reinforce student learning and development.
- The materials also offer a personalized usage report through the “Report” tab in the drop-down menu. This report provides caregivers with insights into their child's progress and engagement with the program, including details about the student's school, teacher, class, and timeline. It also includes information on quizzes completed by the student, offering valuable insights into their performance. Caregivers can utilize this data to understand their child's progress and level of involvement, allowing them to provide targeted support and assistance. The usage report can be downloaded from the website, enabling teachers to share their students' learning progress. These resources foster meaningful home-to-school collaboration and enhance student learning experiences.