TPS STEAM into Science Grade 8

TPS STEAM into Science Grade 8 Executive Summary

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

Grade	TEKS Student %	TEKS Teacher %	ELPS Student %	ELPS Teacher %
Grade 6	100%	100%	100%	100%
Grade 7	100%	100%	100%	100%
Grade 8	100%	100%	100%	100%

Section 2. Instructional Anchor

- The materials are somewhat designed to strategically and systematically integrate scientific and engineering practices, recurring themes and concepts, and grade-level content as outlined in the TEKS.
- The materials 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 somewhat 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 somewhat clear and easy to understand.

Section 7. Supports for All Learners

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

Section 8. Implementation Supports

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

Section 9. Design Features

- The visual design of materials is clear and easy to understand.
- The materials are somewhat 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, recurring themes and concepts, and grade-level content as outlined in the TEKS.

1	Materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of grade-level appropriate scientific and engineering practices as outlined in the TEKS.	M
2	Materials provide multiple opportunities to make connections between and within overarching concepts using the recurring themes.	PM
3	Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level as outlined in the TEKS.	M
4	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 make connections across disciplines and develop an understanding of science concepts.	M

Partial Meets | Score 2/4

The materials partially meet the criteria for this indicator. Materials are designed to strategically and systematically integrate some scientific and engineering practices, recurring themes and concepts, and grade-level content as outlined in the TEKS.

Materials provide multiple opportunities for students to develop, practice, and demonstrate mastery of grade-level appropriate scientific and engineering practices as outlined in the TEKS. Materials provide some opportunities to make connections between and within overarching concepts using the recurring themes. Materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level as outlined in the TEKS. Materials include sufficient opportunities, as outlined in the TEKS, for students to ask questions and plan and conduct classroom, laboratory, and field investigations and to engage in problem-solving to make connections across disciplines and 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 grade-level appropriate scientific and engineering practices as outlined in the TEKS.

- The Activity Reader Book provides lessons with recurring themes, such as a background story and vocabulary that build upon past units. The scientific and engineering practices are hands-on activities that require scientific equipment and materials to be used. Opportunities for cross-curricular content are intertwined within the investigation.
- In the eighth grade Learning By Doing, students are asked to conduct an experiment in which they are asked to build and design a car. They follow the scientific method as they learn about the different forces that act on the object, which is TEKS aligned.
- In the Teacher Edition of the STEAM Activity Guide, instructors guide students through TEKS-aligned activities and phenomena. This guidance gives students multiple opportunities to explore, expand, apply, and analyze scientific ideas, theories, and practices.

- Each chapter begins with an anchoring phenomenon and then provides students with different types of activities such as class discussions, research, vocabulary, reading comprehension, math, and experiments.

Materials provide multiple opportunities to make connections between and within overarching concepts using the recurring themes.

- The lesson plan section of the *Teacher Textbook* provides students with multiple opportunities to develop, practice, and demonstrate mastery of grade-level TEKS through activities, guided discussions, and investigations. Newly introduced TEKS list overarching concepts and recurring themes. Concepts and themes are not stated, leaving the terms open to interpretation instead of explicitly explained, defined, and presented. Materials provide examples of the scaffolding of TEKS between units.
- Newly introduced TEKS list overarching concepts and recurring themes. The lessons provide students with opportunities to use models, patterns, and systems to identify the connection between themes and concepts. The materials do not explicitly state the recurring themes and concepts. Recurring themes and concepts are not stated, leaving the terms open to interpretation instead of explicitly explained, defined, and presented.
- In the Learn By Doing STEAM Activity Reader Book Grade 8, the instructor is provided with guidance on how to facilitate a discussion on specific systems. This guidance is followed by an activity that allows students to stamp the connection between the concept and themes.

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

- In the STEAM Activity Guide Teacher Edition, instructors can find the scientific method. It provides in-depth explanations about the process, which is a recurring theme throughout each activity.
- In the *Teacher Textbook,* the Beginning of Strand chart guides the instructor through TEKS-aligned student learning objectives. There are additional supports for Individual student learning. Students that would learn best from a creative approach would do best with arts and crafts activities in the activity guide.
- For example, students differentiate between physiological, structural, and behavioral adaptations in organisms. This lesson builds upon the prior year when students needed to identify what caused a genetic change and provide examples of those adaptations.

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 make connections across disciplines and develop an understanding of science concepts.

- The *Student Textbook* contains focus questions, which ask students to answer key questions within the investigation. The Test Yourself section contains questions that allow the student to test their knowledge about the new learning.
- In the STEAM Activity Guide- Teacher Edition, in the Preface section under Problem-Solving, there is an overview that explains how students are taught to problem-solve through the "DAPIC" approach. Instructors are also provided with a chart that outlines student and instructor responsibilities throughout the learning cycle.

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- The student's role is to collect and interpret data, apply the concept, and expand on the concept through reading and global situations. However, they are not explicitly asked to plan an investigation. They are given templates and asked to operate within them.
- In the Learn by Doing STEAM Activity Reader Book Grade 8, instructors are provided with reading strategies to assist students in reading independently and acquiring new academic vocabulary. Students also practice comprehension skills to develop language through listening, speaking, and discussion skills.
- The book recommends that students read the chapter introduction with a partner for additional support. Afterward, there is a reading comprehension activity that asks students to cite key vocabulary and evidence in their responses.
- Activities 3 and 4 have students research hurricanes and typhoons, followed by a class discussion. Instructors have received guidance in the text on how to effectively facilitate discussions with students.

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Indicator 2.2

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

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

Meets | Score 4/4

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

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

Evidence includes but is not limited to:

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

- In the *Teacher Textbook,* the lesson plan has a section titled Phenomena, which supports student learning. Phenomena are found throughout each unit, anchoring students in the why and how of the learning.
- Activities found In the Learn By Doing STEAM Activity Reader Book- Teacher Edition follow science and engineering processes. Students are consistently asked to develop hypotheses, collect and analyze data, and summarize activity results as they align with the phenomenon.
- The instructor is provided with the lesson purpose and steps of the engineering process that is TEKS and grade-level aligned. The activities have students practice scientific and engineering practices that align with the concept.
- The *Student Textbook - Grade 8*, highlights activities that drive student learning and mastery of the TEKS. They design posters and create illustrations of literacy text and vocabulary to assist with the learning of academic language. The book provides students with the opportunity to use the scientific method when doing a match combustion activity. Afterward, they practice using key vocabulary words in sentences. Prior to the activity on match combustion, students are asked to read the chapter prompt and do a short reading comprehension activity.

- The *Teacher Textbook,* under the scaffolding section, highlights the alignment between the anchoring phenomenon and the lab assignments. Students are asked to use previous experiences with scientific tools and background knowledge to help guide them through lab assignments. Throughout the chapter, they practice each section of the scientific method, using grade-level concepts that are TEKS aligned to aid in learning.

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

- In the *Teacher Textbook*, instructors are provided an overview of how to access students' prior knowledge and leverage the learning. The lesson plan that discusses SI units has instructors lead students through scaffolded questions to gauge their prior knowledge.
- There is a section on phenomena and scaffolding information from the previous year's TEKS located in the lesson plan. It highlights what standards are built upon and what students should already know.
- In the Learn by Doing STEAM Activity Reader Book Grade 8, instructors learn that most lessons are dependent on a certain level of student comprehension and knowledge. In order to achieve high levels of student mastery, students must apply scientific principles to problems. Instructors are provided with different ways to scaffold student learning based on prior knowledge.
- Students are continuously asked to use the scientific method to solve phenomena and engineering problems. The materials are scaffolded to where the previous units' lessons, themes, and concepts come back up and are used again in a different way.

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

- Lesson plans are clearly outlined with activities and investigations that are aligned with the TEKS. The lesson plan also contains objectives, vocabulary words, and a lesson overview to better support student learning. The plans provide guidance on how to best serve ELL students in the chapter by constructing a dual-language version of keywords and definitions.
- In the Learn By Doing STEAM Activity Reader Grade 8, an outline is provided for the instructor that shows how and when the scientific method is applied throughout the unit. It is recommended that instructors review the process on a consistent basis.
- Teachers are provided with clear student learning objectives that are aligned with the TEKS and the anchoring phenomenon. Instructors and students are provided with the scientific method flowchart to aid in learning how to solve the problem in each activity.

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Indicator 3.1

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

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

Evidence includes but is not limited to:

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

- In Chapter 1 of the Learn By Doing STEAM Activity Reader Book Grade 8, students are provided with an atomic model that explains subatomic particles. Students then explore how atoms and the periodic table are connected.
- The Teacher Textbook covers “The International System Of Units.” The scaffolding shows how the content was studied in previous grade levels. In elementary, students learned how to measure, specifically in grade 5, where students practiced with rulers and other tools. In grade 6 and grade 7, students built off prior knowledge to collect quantitative and qualitative data using some of the same scientific tools in prior grades. Students continue this practice throughout high school. The materials are vertically aligned and designed for students to build and connect their knowledge and skills across grade levels.
- In the Teacher Program Guide - Grades K-8 Science, in the Support for Teachers section, materials include a diagram on vertical alignment. It states that “in order for students to show mastery of the content, it begins with establishing a foundation in Kindergarten. As students progress through each grade, the content is reintroduced and expanded, skills are practiced as the levels and complexity are increased."

- In the *Teacher Textbook*, materials provide a scope and sequence that outlines the order in which students will learn the TEKS. Instructors are also provided guidance on vertical connection to scaffold up or down depending on the needs of the student.

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

- In the *Teacher Textbook,* each lesson has a Scaffolding Information section which provides the teacher with the past, present, and current TEKS to assist with scaffolding the learning for student misconceptions.
- Students investigate scientists that have contributed important science content. They begin by learning about scientists in grades K-2. As the grades progress, students deepen their understanding of these scientists and learn about others who have contributed to our world.
- There is an Essential Content Guide to show the chapters and the TEKS involved in each chapter. In Grade 8, the chapters are TEKS-aligned as outlined in the Scope and Sequence. Chapter 3 is associated with the TEKS 13 ABC.
- In the Online Library Teacher support, the scope and sequence scaffolds learning by outlining each unit to align with the TEKS. The provided calendar shows intentional sequencing to provide students ample opportunities to demonstrate mastery of the content.
- Assignments scale vertically in each chapter. As students work through the Chemical Properties chapter, they are introduced to a story followed by a reading comprehension activity and analysis of the periodic table.

Materials clearly and accurately present grade-level-specific core concepts, recurring themes and concepts, and science and engineering practices.

- In the *Teacher Textbook Grade 8*, lesson plans consist of a description of the concepts that students will be focusing on. As the lesson progresses, the instructor can build upon the concept and recurring themes.
- Chapter 3 of the Learn by Doing STEAM Activity Reader Book Grade 8 Teacher Edition uses the recurring theme of systems as students differentiate between prokaryotic and eukaryotic cells. Students are expected to know the structure and function of organelles within eukaryotic cells and prokaryotic cells. This lesson builds upon lessons from prior years.
- In the *Teacher Textbook Grade 8*, background information on the current concept is provided. Strategies on how to scaffold recurring themes, such as vocabulary from previous years to the current year, are also provided. For instance, students are expected to know the terms matter, molecule, compound, and mixtures. These were first introduced as early as Grade 6, and it is expected students know these words throughout high school.
- The section on Scientists and Scientific Investigations builds on the steps in the scientific method and the appropriate use of safety equipment during investigations. Students previously studied this during grades 6 and 7.
- Activities ask students to discuss parts of a system and how the systems depend on the function. They analyze how changing factors can change stability. Students are asked to describe physical and chemical changes by identifying what happens as we eat. This expectation is aligned with what students must be able to identify for mastery of this TEK.

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Mastery requirements of the materials are within the boundaries of the main concepts of the grade level.

- In the *Teacher Textbook*, there is a section called “Test Yourself” where the student has the opportunity to demonstrate mastery of the TEKS from the lesson activities.
- In the Adhesion and Cohesion activity, when the investigation is complete, students are asked to document if they observed adhesion or cohesion and explain. Assessment questions from the generator allow students to read scenarios and identify adhesion and/or cohesion.
- The mastery requirements are within the boundaries of the main concepts of the grade level. Each chapter ends with multiple-choice questions, a math link connection, and a literacy connection.
- There is an assessment generator that lets the teacher select below, at, or above grade level with multiple choice, open-ended, or both options. The instructor has a choice of whether the question types are formative or summative.

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Indicator 3.2

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

1	Materials support teachers in understanding the horizontal and vertical alignment guiding the development of grade-level content, recurring themes and concepts, and scientific and engineering practices.	M
2	Materials contain explanations and examples of science concepts, including grade-level misconceptions to support the teacher's subject knowledge and recognition of barriers to student conceptual development as outlined in the TEKS.	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 educational components to support teachers' content and knowledge coherence.

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

Evidence includes but is not limited to:

Materials support teachers in understanding the horizontal and vertical alignment guiding the development of grade-level content, recurring themes and concepts, and scientific and engineering practices.

- The Online Library - Teacher support section contains information on the horizontal and vertical alignment that supports student learning through the STEAM storybooks.
- On horizontal alignment, "the STEAM storybooks allow students to engage in a curriculum that builds upon knowledge and skills that are aligned to the TEKS." Additionally, "As students progress through the storybooks, science knowledge is built within each chapter, beginning with the story introducing science concepts interwoven throughout the storyline."
- In vertical alignment, "the process begins in kindergarten, where the foundation is started and expands through upper-grade levels. The scientific content is reintroduced and reviewed in each grade level, and new content is introduced at a higher level with increasing complexity."
- In the Learn by Doing STEAM Activity Reader Book Grade 8, the appendices provide instructors with a guide that highlights how the chapters and TEKS are aligned. For example, Chapter 1 is aligned to 6(ABE), as Chapter 2 is aligned to 6(CD) in the Essential Content Guide.

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

- Each lesson plan in the *Teacher Textbook* has a section titled Common Misconceptions. It provides guidance on how to address misconceptions that students encounter when learning new content. For instance, it lists that students believe the information they find on the internet is valid, and it's important to teach students what is valid information and what isn't.
- In the Learn By Doing STEAM Activity Reader Book-Teacher Edition, the instructor is prompted to have students restate the instructions to check for understanding. This technique supports the teacher in recognizing the student's barriers to conceptual development.
- Each unit follows the same lesson flow, which allows instructors to catch and address misconceptions. The unit starts with the objective, scaffolding information, a scientific explanation, and common misconceptions, providing a clear example of what is continuously found in each unit.
- Instructor support is provided to help reteach a student's misconception prior to the lab. ELL support is provided by using student vocabulary images and completing the work with a friend. Doing this allows fewer student barriers to learning.

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

- The Online Library-Teacher Program Guide, the guide provides the instructor with research-based strategies, information, and guides on how to use the program components. The text further explains how TEKS are covered through activity-based learning and states that storytelling is the main strategy used to design the materials.
- The How to Use the Program explains the intent and purpose of the instructional design of the program, stating that, “students must be with lessons that provide full cognitive involvement.” Students learn best by doing.
- In the Family/Caregiver guide, implementation supports and a navigation guide assist with progress monitoring. A diagram of the navigation guide in the textbook can assist caregivers with students learning at home. For instance, it lets caregivers know the materials match Texas Review Requirements by including methods for progress monitoring, support for all learners, and productive struggle. These are just a few examples of how the materials can support caregivers and learners.

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Indicator 4.1

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

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

Meets | Score 4/4

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

Materials consistently support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. Materials provide multiple opportunities for students to engage with grade-level appropriate scientific texts to gather evidence and develop 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 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.

- Activity 3 in the Teacher Textbook requires students to plan and conduct an experimental investigation. Students choose to conduct one of the three provided investigations. Students are to create a table, analyze their data, think about a flow chart or graph that can support their data, answer questions, and reflect on their work.
- Chapter 7, In the STEAM Activity Guide-Teacher Edition, provides a lesson named "What's In The Bag." In this investigation, students observe a chemical reaction and record their observations in their journals. The activity allows students to act as chemists by mixing and weighing chemicals. They create chemical equations based on what they mix.
- In the Student Journal Grade 8, every lesson supports the students' understanding of the concepts by allowing students to answer focus questions, identify the lab safety through the use of a picture, investigate through planning, and conduct descriptive and field investigations on different activities. For example, in "Classroom Safety," students are provided with an image and asked to investigate the classroom. The scenario in the image is that each student is doing

something wrong, and therefore it needs to be identified within a table. The investigation part requires the teacher to provide the TEA safety standards and discuss as a class how to keep oneself safe. The students are to then create a poster or graphic organizer by listening to all the safety rules that are agreed on by the class. The activities that follow require students to plan and conduct a descriptive investigation, comparative investigation, and experimental investigation.

- The Teacher Textbook has students use a simple engineering design loop to investigate the effect of different materials on the rate of thermal energy transfer. Instructors provide students with questions as students have to think about how to prevent the ice cube from melting, write out the steps they would take/draw a prototype, and adjust their prototype as they learn more.

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

- In the STEAM Activity Guide-Student Edition, students are to research and report on various rockets used and developed by NASA. Students research the different types of rockets and the missions they went on. This activity can be found under the Expanding The Idea III section.
- Chapter 1 in the In Learn By Doing STEAM Activity Reader Book Grade 8 Teacher Edition begins with a story about a project on chemistry. The chapter provides vocabulary, describes an atom and its subatomic particles, and relates it to the periodic table. There are several connection activities, such as a reading comprehension experiment (both teacher and student-led), a table to complete, a grid box to plot responses, a class discussion, and vocabulary.
- In Learn By Doing STEAM Activity Reader Book Grade 8 Student Edition, each chapter has several activities that require students to use background information and vocabulary terms to answer questions. For example, Chapter 1 has students work on an experiment to examine the combustion of a match. Students fill a table with data and incorporate counting atoms and basic math. Students then research and explore several locations related to STEM careers where this type of concept is used.
- Students read about reflected, absorbed, and transmitted light waves. After finishing the science article that goes deeper into electromagnetic radiation, students use text evidence to answer the focus questions. Before students complete the focus questions, they do three different investigations, learning the difference between reflection, refraction, and transmission.

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.

- In the STEAM Activity Guide- Student Edition, students are given the opportunity to write a description of what happens to a penny and dominoes in the Object at Rest investigation. Writing tasks in the investigation include an explanation about how measuring scales work, a conclusion about the investigation that was conducted consisting of heavy and light objects falling, and questions about the heating and cooling of water and soil.
- Chapter 2 in the STEAM Activity Guide-Teacher Edition has students graph the wheel revolutions and the distance traveled to show patterns. In Chapter 17, students create a data table to show the patterns when comparing weather concepts and communicate their table with other classmates.

- In the STEAM Arts Project Guide K-12, there are numerous hands-on projects that are TEKS aligned. “The Infinity That Is Space” lesson has students describe the characteristics of the universe and describe the life cycle of stars and classify stars using the HR diagram. This project allows students to describe the components of the universe and model the HR diagram for classification. Students create a telescope and a snapshot of space with planets and stars. Students will use a handout on the HR diagram to classify stars. Students are then led through a discussion by the instructor.
- The Student Journal is set up so each unit has sections on focus questions, investigation, what was learned where students illustrate or model the concept, math, and literacy challenge. For example, one unit reintroduces to students food webs and systems. The activity starts off with a food web/chain and asks about what could make it a stable or unstable system. Afterward, students draw and label a food web, then create a comic strip on an imaginary underwater food web.

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.

- In the STEAM Activity Guide- Student Edition, the students act as scientists and engineers to apply their knowledge of phenomena to make sense of concepts. In Chapter 19, students apply the knowledge that they learned about weather and clouds to act as a meteorologist to predict the weather based on the weather fronts and clouds appearing on the satellite.
- Activity 7 in Chapter 8 of the Learn By Doing STEAM Activity Reader Book Teacher Edition has students identify a problem and then design, build, and test a solution to the problem. Students are expected to use the Engineering and Design Process (EDP). They initially keep a journal for two weeks to input data in which they will then select a problem to solve.
- In the Student Journal, students review classroom safety by using an image to identify what is considered dangerous and complete a table to explain why. Students are then asked a question and then investigate like scientists. As students are investigating, they complete data tables and conclude by answering questions and creating a crossword puzzle with questions.

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Indicator 5.1

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

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

Partial Meets | Score 2/4

The materials partially meet the criteria for this indicator. Materials somewhat 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 some argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and grade level. Materials provide opportunities for students to construct and present developmentally appropriate written and/or verbal arguments that justify explanations to phenomena and solutions to problems using evidence acquired from learning experiences.

Evidence includes but is not limited to:

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

- Chapter 14 In the STEAM Activity Guide - Teacher Edition has students make hypotheses about which cylinder will roll down the inclined plane faster.
- Chapter 27 in the STEAM Activity Guide - Student Edition focuses on a balanced ecosystem and understanding how the populations and species are dependent on one another. In Getting The Idea, the student develops a hypothesis about how carbon dioxide and oxygen are produced by organisms in a habitat based on the life-sustaining cycle.
- Chapter 4 in the Learn By Doing STEAM Activity Reader Book - Student Edition has students observe the effects of acceleration by changing the mass of an object hit by a constant force. Students predict the outcome of the experiment, draw and label the experimental equipment, and then calculate the average speed of each car and conclude if their hypothesis was correct.
- Chapter 2 In the Learn By Doing STEAM Activity Reader Book - Teacher Edition has students observe what they expect to see concerning water and its behavior on different surfaces. Students record their results in drawings and words to describe the water meniscus. They then analyze and discuss the results.

- In the *Student Textbook,* students discuss if resources are renewable or nonrenewable and the consequences of using natural resources and alternatives. Students engage in discourse on these topics, using evidence to support their claims.

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

- In the STEAM Art Projects section of the STEAM Activity Guide-Student Edition, each project has a list of science vocabulary words that students should focus on while completing the project. The vocabulary is embedded within the steps of the project as opportunities to develop context. In the Infinity That Is Space project, the focus vocabulary words are telescope, universe, stars, and classification. In step two, students create a list of components that make up the universe using the key vocabulary words.
- In the Program Components section of the Family and Caregiver Guide, the Learn By Doing Steam Activity Reader Book is referenced and states that students should review the vocabulary using vocabulary cards. The objective of the vocabulary activity is for students to understand the meaning of the words and recognize when the word is spoken.
- In Learn By Doing STEAM Activity Reader Book Teacher Edition, there is plenty of evidence in the material that includes embedded opportunities for students to develop and utilize vocabulary. For example, Chapter 1, Fire and Water, contains vocabulary embedded in the passage. The students review the vocabulary words to understand their meaning in activity one.
- The Student Journal has several units that contain opportunities for students to develop and utilize scientific vocabulary in the context. Students write some characteristics about four vocabulary words and test their knowledge on the next page by answering four questions. Another example is that students write some characteristics and draw an image on the following terms: air quality, pollutant, primary pollutant, and secondary pollutant.
- The Blackline Master K-8 section of the Online Library has a glossary that focuses on key terms that are aligned to the grade-specific TEK. Examples of a few terms are allele, atomic mass, atomic number, and weather maps.

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

- Chapter 3 In the STEAM Activity Guide - Teacher Edition has students discuss the patterns observed and summarize how changing the diameter of the wheel changes the performance.
- Chapter 3 In the STEAM Activity Guide - Student Edition has students discuss how changing the pulling location of a string on the lever affects the force.
- The Teacher Textbook and Student Textbook use the words argumentation/discussion/debate on 32 occasions. Of those occasions, the words are used 14 times as titles, headings, or integrated into a text. They are not used throughout the material as a means to elicit argumentation. Merriam-Webster states that the definition of argumentation is the act or process of forming reasons and of drawing conclusions, and applying them to a case in discussion. Materials use the word discussion and say, "you should take part in a class discussion" or "provide details on how and why scientists discuss" but do not explicitly state students should be doing so. Some references meet the criteria for success, but these opportunities are partially integrated into the material.
- In Learn By Doing STEAM Science Activity Reader Book - Teacher Edition, each chapter has activities that integrate argumentation and discourse to support students' development of the content. For example, in Chapter 1, Fire and Water, students analyze and discuss observations

after an experiment with a few prompts provided by the teacher. Examples of those questions include “Was there a difference in the mass of the matches before or after burning compared to the control unburned matches? If the mass was released, where did the rest go?” In Activity 4, students discuss their daily life and explain chemical reactions they have observed that day. Students are also to discuss how the reaction for photosynthesis demonstrates the law of conservation of mass.

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.

- Chapter 8 In the STEAM Activity Guide- Student Guide has students write a conclusion about how mass is related to force, a description of what happens to the penny when it is at rest and a force is applied to an index card, and a description of what happens to dominoes when a force is applied.
- In Learn By Doing STEAM Activity Reader Book Teacher Edition, Chapter 6 has several activities that provide opportunities for students to construct and present written or verbal arguments to justify concepts. For example, the Climate Change Research Project has students use scientific evidence to research climate change and address several prompts provided by the instructor. Activity 6, Satellite Images, has students examine the satellite image of Earth and observe what cannot be seen from an aircraft or from the ground and have a discussion on it.
- In Learn By Doing STEAM Activity Reader Book Student Edition, students read the chapter on Forces of the Universe and answer the questions using text evidence. An example of questions that students answer is, “Why do astronomers use astronomical units and light years? Describe the different galaxy shapes. What is a supercluster?” Students also write a response to a prompt about the life cycle of different stars and describe the HR diagram.
- In the *Teacher Textbook*, students construct a stable food web, explain what it means, and why their food web is a good example of stability. Students are prompted to engage in argumentation to justify why their food web is stable, using the activities done in the lesson to support their argument.

TPS STEAM into Science Grade 8

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.

- Chapter 17 in the STEAM Activity Guide - Teacher Edition provides the instructor guidance on addressing students' responses to questions based on their experiences. For example, students are asked how they calibrated their measurements. The instructor is given a snippet of an acceptable student response.
- In the *Teacher Textbook,* students do an investigation on "Creating a convincing explanation on how a roller coaster works based on the motion and energy concepts they have learned." The Teacher Guided Questions To Inquiry are used by the instructor to guide students as they plan. The materials state that "students' answers will vary but also says what they should mention…"
- The Teacher Edition of the Learn By Doing STEAM Reader Activity Reader provides the instructor guidance on expecting students' responses and the use of questioning to deepen their thinking. During the Acid or Base? unit, students test materials to determine if they are acidic or basic as they follow the scientific method. Students read the story and test different solutions to see if they are acidic or basic. Students write their hypothesis on which liquid or solution would be acidic, neutral, or basic and then support their hypothesis with data after a class discussion.
- In the Student Journal, instructors are provided guided questions to support student inquiry. For example, the unit on Transmitting Frequencies has students answer each question in the activity and discuss their responses. Under the investigation section, students work in pairs to research

and compare vinyl records and a CD. They answer several questions and then present their findings and arguments in any medium of choice, such as PowerPoint, poster, speech, etc.

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

- Chapter 17 in the STEAM Activity Guide - Teacher Edition provides the instructor guidance on how to support students who might be unfamiliar with the term humidity. The instructor is guided to review the water cycle to refresh student understanding and discuss the effect that temperature and pressure have on humidity.
- In the Preface section of the STEAM Activity Guide - Teacher Edition, instructors are given guidance on how to scaffold for students in special populations.
- The lesson on the Periodic Table in the *Teacher Textbook* has students learning the basic features of the periodic table. The students have a black-and-white periodic table and will color the periods and groups. Then students color other parts associated with the key vocabulary on the periodic table.
- The Teacher Edition of the Learn By Doing STEAM Activity Reader Book provides guidance on how to scaffold students' development and use of scientific vocabulary with appendices that outlines each chapter. Newton's Laws of Motion chapter includes TEKS 7 (AB). Students learn the relationship between force, motion, and energy within systems. They learn to calculate acceleration, net force, and mass and differentiate the three laws of motion.
- In the Learn By Doing STEAM Activity Reader Book - Teacher Edition, the instructor is provided with guidance that specifies what a student can do with vocabulary that is embedded in each chapter. For example, Chapter 5, Forces of the Universe, has the vocabulary embedded within the text. In Activity 12, students are provided with a table of all the words and are required to know the meaning.
- An activity in the Teacher Textbook tells the instructor to provide students with photographs to tell a simple story. They use the photograph to tell any story they wish to practice using English vocabulary by learning and using routine language skills, speaking using grade-level content vocabulary in context to build language proficiency, and internalizing new words.

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

- Chapter 18 In the STEAM Activity Guide - Teacher Edition has students discuss and debate the Homestead Act. The discussion and debate focus on the treatment and displacement of the Native Americans.
- The *Teacher Textbook* gives the instructor information that could be used as guidance for students in the Background, Introduction, Teacher Tips, Project-Based Lessons, and Common Misconceptions sections. There are little to no student examples of materials that provide exemplar responses as a guide for eliciting more student thinking or finding solutions.
- The Teacher Edition of the Learn By Doing STEAM Activity Reader Book provides guidance for instructors on how to prepare students to use evidence to construct written and verbal claims. Under the subsection "Comprehension Skills," instructors encourage students to develop oral language through listening, speaking, discussing, and responding using newly acquired vocabulary. For example, Chapter 2, Carwash, has students read the chapter and answer the questions using text evidence to support the responses. During Activity 2, students write a

hypothesis on what observations they expect to see concerning water and its behavior on different surfaces. Students then analyze and discuss their results with the class.

- The Student Journal provides the instructor guidance throughout each unit to support students in using evidence to construct written and verbal claims, such as the Literacy Connection on photosynthesis. The instructor is provided guidance on assisting students with the connection between how mass is conserved in chemical reactions and how the atoms become rearranged through chemical equations such as photosynthesis. Students are to acquire the knowledge of photosynthesis by reading through texts to determine the main idea, providing accurate summaries of the text, and drawing an image of a plant as it photosynthesizes.
- During the Teacher Guided Questions To Inquiry sections in the *Teacher Textbook*, the instructor is to accept all answers, ask follow-up and probing questions, encourage discussion and engagement in a respectful and courteous debate, and encourage students to use applied scientific explanations and empirical evidence. During the discussion, students are expected to listen closely to each other. The instructor should encourage students to use accessible language, learn new and essential language, and take time to discuss terms that students may not understand.

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

- Chapter 2 in the STEAM Activity Guide - Teacher Edition calls for the instructor to ask the students about their predictions and encourages students to explain their thinking. In Chapter 3, students make predictions about what changes they think will occur if the wheel diameter is changed.
- The *Teacher Textbook* gives the instructor information that could be used as guidance for students in the Background, Introduction, Teacher Tips, Project-Based Lessons, and Common Misconceptions sections. There are little to no student examples of materials that provide exemplar responses as a guide for eliciting more student thinking or finding solutions.
- Chapter 3 in the Learn By Doing STEAM Activity Reader has students read the text and respond to the following prompt: What would happen in a cell if one of its systems failed? In Activity 5, students observe and differentiate between animal and plant cells. Students explain how different cells are from the cell models that are in the textbook and explain what it tells about the limitations of a model.
- Chapter 4 in the Learn By Doing STEAM Activity Reader Book - Student Edition requires students to answer questions using text evidence about Newton's Laws and provide responses to solutions with their own thoughts. In Activity 2, students explore the effect of acceleration by changing the mass of an object hit by a constant force. Students discuss and analyze by answering questions such as: "Was there significant variability in the data? Why do you think this happened? How would you have done this experiment differently?"

TPS STEAM into Science Grade 8

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 with recurring themes and concepts.	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 that include formal and informal opportunities to assess student learning in a variety of formats. Materials assess all student expectations and indicate which student expectations are assessed. Materials include assessments that integrate scientific concepts and science and engineering practices with recurring themes and concepts. 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 Chapter 2 assessment in the STEAM Activity Guide - Teacher Edition consists of objectives, a problem/task, and requirements for submission. The student assessment is graded based on a grading rubric.
- The STEAM Arts Project in STEAM Activity Guide - Student Edition has a project named “Infinity That Is Space.” Under the Collaboration Discussion and Assessment, the student is provided with questions to answer for the assessment.
- The Introduction of the Teacher Textbook has a section on the Assessment Guide that includes: Safety, Investigation & Reasoning lessons, Using Tools, Amelia Rose, Science Makers, Multiple Choice and Open Ended Questions, Performance Tasks, and Skills Assessments. It states that “This book includes...and sets out assessments using a variety of strategies: science makers, formal written tests, and reader activity book assessments, plus safety, investigation and reasoning content.”
- Chapter 4 in the Learn By Doing STEAM Activity Reader Book is titled “Newton's Laws Of Motion!” In Activity 2, students explore Newton's Second Law by calculating and analyzing how the acceleration of an object. In Activity 3, students use spring scales to measure force by
- The Assessment Tools K-8 in the Online Library provides instructors with an assessment generator to provide a formal assessment for the students. Teachers select the TEKS, Scientific

and Engineering practice, and have options to have multiple choice, open-ended, or both options.

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

- Chapter 2 in the STEAM Activity Guide - Teacher Edition provides the instructor with objectives that align with the task that students must complete for the assessment. The objectives in the chapter consist of putting information from data tables into an appropriate chart or graph, finding a pattern in a set of data, and making inferences from data collected. In the Problem/Task section, students work with the local PTA (parent-teacher association). The PTA has donated funds for the school to order new playground equipment. Students will work to design an investigation to gather useful data to convince the school playground committee to purchase a particular slide design.
- The Infinity That Is Space Project in the STEAM Activity Guide - Student Edition gives students the standards for the project and the lesson's purpose.
- The Interactive Assessment Tool - Online Test and Quizzes provides questions for each student expectation.
- The Learn By Doing STEAM Activity Reader Book - Teacher Edition has a section that provides instructors a way to assess students formally. Each question is aligned with the TEKS and assesses all student expectations.
- The Pacing Guide in the Online Library - Teacher Support section has a pacing plan with a day-to-day breakdown of each unit to be taught. After each unit, there is time for revision, assessment, and reteach of the concepts. This format allows instructors to assess all student expectations.

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

- The Assessment Tool in the Interactive Assessment Software Tool - Online Test and Quizzes is aligned to the TEKs that the instructor wants to assess the student on. The instructor has the choice to integrate Scientific Concepts, Science Of Engineering Practice, recurring themes, and concepts to assess.
- The Online Library has an interactive assessment software tool that integrates Scientific Concepts as well as Scientific and Engineering Practices. Instructors can use the online tests and quizzes to assess students on the different TEKS that are being covered up to one hundred attempts.
- The Online Library - Teacher Support has a section that includes an assessment matrix that includes each unit and its TEKS. Instructors add their students' names to include notes and scores to the concept. Instructors can further track students' understanding of the recurring themes and concepts.

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

- Chapter 2 in the STEAM Activity Guide - Teacher Edition provides instructors with objectives that align with the problem/ task that the student must complete for the assessment. The objectives in Chapter 2 consist of students putting information from data tables into an appropriate chart or graph, finding a pattern in a set of data, and making inferences from the data collected. The problem that the students are given is to design an investigation to gather useful data to

convince the school playground committee to purchase a particular slide design. Students are graded using a grading rubric with criteria aligned with the objectives of the tasks.

- The Student Journal has a section in each unit where students test themselves on their knowledge and skills/vocabulary. For example, the unit on acceleration has students calculate the acceleration of an object and other key concepts using their knowledge and skills of Newton's Second Law of Motion.
- The Student Journal has a Math and Literacy Challenge where students connect the concepts that are being taught. They can be assessed through the use of knowledge and skills and make a connection with other subjects. For example, as students study Newton's Second Law, they predict what could happen to the acceleration of a car if the mass was doubled, not changed, or applied double the force. Students explain what action-reaction forces are and identify what the reaction force would be in several examples.

TPS STEAM into Science Grade 8

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.

- The Chapter 1 assessment in the STEAM Activity Guide Teacher Edition provides the instructor notes on what to look for when grading and elaborates on how to grade the task that the students solve.
- In the Blackline Master K-8, benchmark tests are broken down by the TEKS level. Assessments range from Level One questions up to Level Three. Instructors have the opportunity to leverage different activities based on the assessment to respond to student data. The assessment provides the instructor with the correct answer for multiple-choice questions.
- The appendices in the Learn By Doing STEAM Activity Reader Book provide instructors with an essential content guide to evaluate students' responses by aligning the TEKS, concepts, and vocabulary in student responses.
- In Learn By Doing STEAM Activity Reader Book - Teacher Edition, instructors are provided with guidance for questions that can be used in any way for each lesson at the end of the resource material. TEKS and answers can help guide student responses.
- The Teacher Textbook provides instructors with a support section. The Test Yourself section is used to evaluate student mastery. It includes multiple-choice questions, and the correct answer choice is checked for the teacher's knowledge. The What Have You Learned section includes a

four-square quadrant, stating, “In each of the quadrants below, write down some characteristics of each one of the vocabulary words you recently learned. Add a picture to help you remember the meaning of the term.” The teacher’s guide includes the phrase “student answers will vary.” Throughout the materials, activities and worksheets include possible student answers.

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 assessment in Chapter 3 of the STEAM Activity Guide Teacher Edition provides the instructor notes so that they can modify the grading rubric based on the needs and levels of the students.
- The assessment in Chapter 3 of the STEAM Activity Guide - Teacher Edition provides the instructor notes so that they can modify the grading rubric based on the needs and levels of the students.
- The Beginning Of Strand in the Teacher Textbook directs the instructor on how to proceed with responding to individual students' needs.
- The Teacher Support section in the Online Library has a Learn By Doing Assessment Rubric that is an Excel spreadsheet with guidance on the TEKs and detailed content. The assessment asks questions about the concepts and then guides instructors with information on how to monitor proficiency levels and use student responses in lessons.
- The STEAM Science section in the Online Library provides activity guides for different topics that instructors can use for students who have demonstrated mastery, have not demonstrated mastery, and special education students. Activities are personalized and assessed based on student journaling. Students that demonstrate mastery work on this as a project and still be assessed formally. For example, in Chapter 4, Newton’s Law of Motion, in Activity 2, students calculate and analyze how the acceleration of an object is dependent upon the net force action on the object and the mass of the object using Newton’s Second Law of Motion.
- Activities in the Teacher Textbook prompt instructors to include word walls by printing out the vocabulary words from the glossary and encourage students to practice vocabulary to best support all student learning.

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

- In the STEAM Arts Project section of the STEAM Activity Guide Edition, the instructor is provided guidance on how to support RTI students and additional extension activities as students complete the Weather Systems project.
- The Teacher Textbook uses Beginning of a Strand that directs instructors to determine students' initial understanding using the assessment database. Afterward, the materials direct the instructor to determine the best possible strategy to address student needs.
- The Teacher Support section of the Online Library has a video titled “How to use the [platform] Assessment Generator tool.” These exams are formative and can be utilized throughout the school year. Level One is for students showing a lower level of mastery, Level Two is for students on grade level, and Level Three is for students demonstrating mastery.
- The Online Library - Teacher Support section has a Learn By Doing Assessment Rubric provides instructors with the TEKS, locations of the materials within the resources, specific and general

assessment questions, and steps on how to evaluate student levels. For example, TEKS 13 (AB) tells instructors what to do after reading the chapter with students, what questions to ask students about cellular organelles, then use the rubric to ask students scaffolded questions.

- The Intervention Focus Tutorial K-8 can be used both for intervention and advanced student content for instructors. Instructors can use the materials as a means for reteaching lessons that students did not demonstrate mastery with or accelerating students who have demonstrated mastery.

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

- In the Blackline Master K-8, benchmark tests are broken down by the TEKS level. Assessments range from Level One questions up to Level Three. Instructors have the opportunity to leverage different activities based on the assessment to respond to student data. The assessment provides the instructor with the correct answer for multiple-choice questions.
- The Teacher Textbook provides a variety of student resources such as STEAM arts projects, Focus Tutorials, and Reader books. The instructor uses a diagram that is mentioned so they can choose the resource to best support student mastery level. Some of the situations these activities can be used for are: knows but does not understand and additional individual help.
- The Teacher Support section in the Online Library has a section titled “Blackline Master for K-8.” It provides benchmark tests with an outline for each question and answer that assists instructors in responding to individual student data. These exams are formative and can be utilized throughout the school year. Level One is for students showing a lower level of mastery, Level Two is for students on grade level, and Level Three is for students demonstrating mastery.
- The K-8 Critical Thinking section in the Online Library provides students with practice in answering questions and building literacy skills in science. Instructors use them as reviews for assessments (diagnostic, formative, unit test), homework, or to be done at the beginning of class. The book is designed to help the instructor assess the students’ progress on an ongoing basis and use it as a response to other data.

TPS STEAM into Science Grade 8

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.	PM
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

Partial Meets | Score 1/2

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

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

- Each assessment in the STEAM Activity Guide - Teacher Edition contains items that are scientifically accurate, avoid bias, and are free from errors. In Chapter 2, the assessment uses objects in the scenario that are familiar to all students, such as the PTA, playground equipment, and a playground slide.
- Each chapter in the Learn By Doing STEAM Activity Reader Book - Teacher Edition contains items that are scientifically accurate, avoid bias, and are free from errors. For example, Chapter 4, “Newton's Laws of Motion,” has an image of children of diverse backgrounds on a rollercoaster ride to demonstrate the Second Law Of Motion. Each question is aligned with the TEKS and follows the scientific process of learning.
- The STEAM Science/ELA/Math, PSHE section in the Online Library contains plenty of evidence that is scientifically accurate, avoids bias, and is free from errors. For example, the NEST family videos are of diverse topics and are aligned to the TEKS that are being taught per grade level.

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

- The assessment in Chapter 2 of the STEAM Activity Guide - Teacher Edition contains graphics such as the grading rubric but does not contain any pictures. The grading rubric graphic is developmentally appropriate for students to understand the criteria for the grading process. Test questions in the Assessment Generator provide students with developmentally appropriate

images on four occasions (out of the 212 test questions) for grade six. Grades seven and eight test questions are similar to grade 6.

- Assessment tools in the K-8 Online Library do not contain pictures/images. Referred material by the publisher in the Teacher Textbook is not used as or for an assessment. Questions in the Learn By Doing STEAM Activity Reader Book provide formative and informative assessment questions. The Test Yourself section does not include any graphics in the Teacher or Student Edition. The indicator uses the terms pictures and graphics in the plural form. Test questions in the Assessment Generator provide students with developmentally appropriate images on four occasions (out of the 212 test questions) for grade six. Grades seven and eight test questions are similar to grade six.
- Each chapter in the Learn By Doing STEAM Activity Reader Book - Teacher Edition has pictures that are clear and easily understood by the learner. Each image is aligned to the TEKS/concepts that are being presented in the chapter so that the learner is able to make a clear connection. For example, Chapter 1, “Fire and Water,” has images aligned to the text. The images are clear so that the students can understand the meaning of each term and understand the text. Some images includes are of combustion, the structure of an atom, the modern periodic table of chemical elements, etc.

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

- Chapter 16 in the STEAM Activity Guide - Teacher Edition contains instructor assessment notes that provide guidance to ensure the accurate administration of assessment tools. The instructor is also given guidance in the assessment overview at the beginning of the chapter for materials to provide to the student in order for them to accurately administer the assessment.
- The materials include a distinct section in the Teacher’s Program Guide that supports the teacher in understanding the types of informal assessment tools in the curriculum. Teachers are provided with an assessment matrix to show which assessments are utilized throughout the course. They provide a place to add results from any tests they design from the interactive software tool, assessment generator, or any informal assessment from the materials.
- The Online Library has a Teacher Support section that has “How to Videos” on how to use the assessment generator tool, how to store information, and reuse questions. The videos provide guidance on how to create assessments by TEKS, skill level, and how to personalize.
- The Learn By Doing STEAM Activity Reader Book - Teacher Edition provides instructors with guidance to ensure consistent and accurate administration of assessment tools using the essential content guide. Each chapter is correlated with the TEKS that follow the lesson.
- The assessment generator creates an overview of the created assessment. Instructors can press on the show/hide answer button to see sample student answers and how to score open-ended responses.

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

- The Weather Systems Project in the STEAM Art Project section of the STEAM Activity Guide - Student Edition provides the instructor guidance on how to support RTI students with accommodations for assessments.
- Art Projects and Literacy Connections provide alternative assessments for students that access mastery non-traditionally. Students use what they've learned and are accessed through

discussion and debriefing instead of true/false questions, multiple choice, or open-ended questions.

- The materials offer accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals. There is also guidance on how to add alternate text for images. For example, when using the Online Assessment Generator, teachers can create assessments with above, below, or at-grade-level questions and reduce the length of the exam with fewer questions to ensure assessment alignment to meet the needs of all students.
- The Assessment Tools K-8 Science in the Online Library has Intervention Focus Tutorials for each grade level. They outline each TEK with vocabulary to review and performance tasks to complete.
- The STEAM Science/ELA/Math/PSHE in the Online Library - STEAM contains activity guides that teachers can assign kits to students who need assistance in improving their literacy and numeracy skills, and the teachers can utilize it as an alternate assessment.

TPS STEAM into Science Grade 8

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 grade-level 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 grade-level mastery.

- In the STEAM Activity Guide, in the Preface under the IMaST Learning Cycle section, there is a framework in which students learn content. The steps began with exploring, getting the idea, applying the idea, and expanding the idea.
- In the STEAM Activity Guide-Teacher Edition, in the Challenge Of The Races, the instructor scaffolds the lesson by asking probing questions and guiding students to problem solve rather than giving them the answer when they do not understand. The job of the instructor is to be the facilitator of the learning and let students be in charge of their own learning.
- In Chapter 1, “Fire and Water,” of the Learn By Doing STEAM Activity Reader Book Teacher Edition, each activity starts with the teacher asking the students to restate the instructions to check for understanding. Instructors teach students about the usage of microscopes and prompt the instructor to work with students who are having trouble focusing their slides. The teacher adjusts and has students illustrate what is seen.
- In Learn By Doing STEAM Activity Reader Book (SE) Grade 8, each chapter reading contains sentences in bold that rephrases or provide extra examples or defines the concepts. In Chapter 2, “Carwash,” the rephrases or extra examples in bold can be found.
- The Steam Activity Guide says that “students may find it difficult to identify and name the different components that make up the universe and how they correspond to one another. You may need to have separate diagrams that show the transition between each component. Students may need to learn hand gestures for them; stars can be shown pinching the fingers together, galaxies by hands far apart.” This comment is a clear example of targeted instruction during a lesson or activity.

TPS STEAM into Science Grade 8

Materials provide enrichment activities for all levels of learners.

- In the Online Teacher Support- Family and Caregiver Guide, in the Family Visit section, it stated that the student textbook contains an At Home section where students are to visit different state locations with their family as well as content that is completed at home with the help of parents/caregivers.
- Chapter 4, “Newton's Laws of Motion,” in the Learn By Doing STEAM Activity Reader Book Guide provides multiple activities for student enrichment. Activity 1 requires students to read the story and complete the questions, which is the ELAR extension. Activity 2 has students calculate the acceleration of an object, and they learn how it is dependent upon the net force and mass of an object. Students use a variety of tools and plot their data. In Activity 3, students use a spring scale to measure the force of four different books and complete four trials for each. Students then plot data on a graph.
- The STEAM Activity Guide provides extension activities as well as RTI support. The RTI support says that there are many websites and apps available for students to click through the different stages of the universe. It also states that students may be comfortable looking at the universe we are in and breaking the diagram into smaller parts. The extension activity has students answer questions about space travel and the obstacles that come with it.

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

- An alternative Scope and Sequence for RTI students along with the TEKS that aligns with the activities is provided in the Online Library - Teacher Support Section.
- In the Teacher Program Guide K- 8, under the Support Needs For Teachers, bullet point three discusses how the goal of the program is for students to master all TEKS. If students are having a difficult time with concepts, it gives teachers guidance on how to address the students' needs. If students master the TEKS, guidance is also given on how to allow the student to progress and what level of questions to give the student on assessments.
- Students are provided with guidance for just-in-time learning acceleration that can be found in the online learning student reasoning library. There are four scientific investigations and reasoning in the book. For example, the first investigation is on Working Safely and Responsibly, which provides a passage followed by keywords that the student should be aware of and identify within the reading. Focus questions are included, and an investigation section where students design a poster to explain one way that a student can work safely and responsibly in the classroom. The investigation has a section on What Was Learned with questions and a section to evaluate their learning.
- Acceleration of learning works best when scaffolding builds on what students already know, so when students tie background knowledge to new information, they are better at making inferences and are better at remembering the new information more effectively so therefore, the publisher provides, through the online library resources, a crosscutting library with photographs in case students are researching and are working on a project. They can use this to grab real images through Google.
- Bullet 5 of the Teacher Program Guide states “that stories are meant to engage all learners. There are additional storybooks to assist students below grade level and an intervention focus tutorial. Some STEM and Arts projects in the online library can be used for advanced or special education students, but they are all inclusive and any students will enjoy them. If students are struggling with language, instructors can use Archway to support.”

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Indicator 7.2

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

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

Partial Meets | Score 2/4

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

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

Evidence includes but is not limited to:

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

- The IMaST Learning Cycle Section In the STEAM Activity Guide - Teacher Edition provides an overview of Exploring, Getting The Idea, Applying The Idea, and Expanding The Idea sections. When students explore, the instructor acts as the facilitator. They provide students with opportunities to test materials, manipulate objects, make observations, and collect data. During the Getting The Idea section, students engage in discussions about their findings and experiences during the Exploring. The instructor addresses misconceptions in the learning and questions students.
- In the STEAM Activity Guide Teacher Edition, each lesson provides the instructor with an introduction to the lesson and the lesson objectives. In Chapter 1, the introduction provides the instructor with a snippet of what students will be doing in each section of the learning cycle and how to facilitate student learning.
- The Online Teacher Textbook gives an overview of all the steps that can be taken by the instructor for a variety of developmentally appropriate instructional approaches to engage students in the mastery of the content. The suggested steps provided by the text are listed sequentially as follows: Learn by Doing Activity Reader, Student Textbook (which has a variety of

different instructional approaches), the STEAM Guide for STEM and Art projects, and an assessment.

- The scope and sequence outlines each unit with the student learning objective and the key concept that is TEKs aligned. For example, Unit 4, Earth and Space, is where the student describes the characteristics of the universe and the relative scale of its components; the student knows that interactions between Earth, ocean, and weather systems impact climate; the student knows that natural events and human activity can impact global climate. The aligned TEKS: 9ABC, 10ABC, and 11ABC are referenced again in other lessons such as Weather Reporters through the STEAM reader, What's In A Galaxy? in the Teacher Textbook, and What Can We Expect? in the STEAM Activity Guide Teacher Edition.
- Each chapter In Learn By Doing STEAM Activity Reader Book provides a variety of instructional approaches to engage students in the mastery of the content. For example, Chapter 4, Newton's Laws of Motion, has a reading section that provides bolded information for vocabulary or key notes to be used on questions or activities. Activity 1 is reading comprehension, where students read the passage and answer the questions. In Activity 2, students work in a lab to calculate acceleration with different objects and record data through a graph. Activity 3 is a lab to calculate force with spring scales.

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

- In Chapter 1 of the STEAM Activity Guide, the instructor is given guidance on putting the student into groups based on ability level or making diverse groups with different ability levels. In Chapter 4, Learning to Communicate, students discuss and share their results and conclusion with the whole group.
- In the Online Teacher Support- Family and Caregiver Guide K-8, in the Teaching Pedagogy-Storytelling and STEAM, it stated that the stories could be read in groups with the instructor or in the home with the caregiver.
- In Learn By Doing STEAM Activity Reader Teacher Edition, each activity supports flexible grouping, for example. In Chapter 2, Car Wash, Activity 1 is a one-on-one assignment where students read the chapter and then answer questions. Activity 2 is a small group activity where students work on an experiment that follows the scientific method. Activity 3 is a small group activity where students test materials to determine if they are acidic or basic.
- The Online Library-Interactive Assessment Software tool allows teachers to create assessments that are TEKS aligned and assist instructors with providing extra support to individual students who are struggling with mastering the content. Instructors can create questions to be assigned to the whole group as a class test to assess content. For example, if a teacher wants to focus on the following TEKS 13C for Grade 8, the ID# is 11719.
- The Learn By Doing STEAM Activity Reader Book starts with students being asked to answer reading comprehension questions after reading the chapter story. They can do this alone or with a partner. Activity 10 is a succession research project done in a small group that addresses the research question: “Describe the process of succession following a volcanic eruption and fire. Include the timeline and stages. Identify the cause and effect of succession.” The whole class discussion is a five-minute presentation where students ask questions to their peers.

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

- Chapter 1 In the STEAM Activity Guide - Teacher Edition has students work collaboratively in the Exploring The Idea section to complete the focus questions. In the Exploring section, the teacher also guides learning by asking probing questions. In Chapter 1, Student Assessment, the students work independently and collaboratively to write a conclusion about what they have learned.
- Materials partially support modeling. The indicator refers to modeling as the instructor showing students what they should be doing and how. The provided evidence from the publisher does not align with TEA expectations of modeling. Publisher refers to making models of scientific phenomenon compared to showing students how to solve a specific problem (such as calculating speed). The Teacher Textbook states that the instructor may choose to demonstrate malleability. Opportunities for teachers to model a skill are not explicitly stated on a consistent basis. The Teacher Textbook contains opportunities for collaboration, such as helping students decide on questions that can be answered using an experimental investigation.
- Instructors and students are provided context on how to practice modeling the concept when collaboration among students occurs and independent practice such as answering questions. For example, Chapter 1, Fire and Water, supports independent practice, provides guidance from the instructor, allows collaborative practice for students as they work in groups, and allows some teacher modeling.
- Unit 2, Matter and Energy, guides the instructor to use the Learn By Doing STEAM Activity Reader Book Chapter 1, Fire and Water, as a way to support multiple types of practices. The chapter's activities are aligned to support independent practice, such as activity one, which is a reading comprehension activity. Materials support guided practice, which tells the instructor to make sure to wear safety gear and go over the safe practice of using a hot plate. Materials support collaborative practice where students work in small groups on an experiment and discuss the results. Students also research a STEM career and discuss it in their investigation.
- The Teacher Textbook begins with the instructor explaining the periodic table and how it's organized. Students then look inside each box to identify each part and what it represents. Students are then guided through information about metals, nonmetals, and metalloids. They color each section based on what it represents. Afterward, they answer questions in the student exercise about the periodic table (this can be done by themselves or with a partner). The test practice questions are an individual activity.

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

- In the STEAM Activity Guide - Student Edition, diversity is shown in the images in the textbook based on race, age, and gender. The textbook includes images of both men and women and people of different ethnic backgrounds.
- In the STEAM Activity Guide - Student Edition, the images represent a diversity of places, such as the International Space Station, a gym, a theme park, and a chemical plant.
- In Learn By Doing STEAM Activity Reader Book - Teacher Edition, there are multiple images that represent a diversity of communities. For example, Chapter 1, Fire and Water, has an image representing children and teachers of diverse backgrounds and disabilities that are working together to think of a good chemistry project. Chapter 4, Newton's Law of Motion, has images of students of diverse backgrounds on a rollercoaster demonstrating the First Law of Motion. Chapter 5, Forces of the Universe, has an image of an astronaut, and below the caption reads

"Rosa's Dream," which represents how a little girl wishes to one day be able to see the stars from space on a spaceship.

- In the Online Library-Crosscutting Library (Photographs), there are numerous locations of images of different concepts that are aligned to the TEKS and show a diversity of communities. For example, the photographs of star distances show images of stars like the sun from different perspectives on Earth to the Universe.
- The cover of the Teacher Program Guide has a diverse cast of people in science. The Teacher Program Guide demonstrates a diverse classroom of students engaged in learning.

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Indicator 7.3

Materials include listening, speaking, reading, and writing support to assist emergent bilingual students in meeting grade-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 support to assist emergent bilingual students in meeting grade-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.

- Under the Problem Solving sections of the STEAM Activity Guide - Teacher Edition, it states that the last step of the problem-solving process is communicating. The communication step focuses on analyzing results and sharing results with others, both written and oral.
- The ELPS spreadsheet contains Cross-curricular second language acquisition/learning strategies, expectations, audience, type, material component, page number, URL, and description of location.
- The Teacher Edition of the Learn By Doing STEAM Activity Reader Book includes guidance for instructors on linguistic accommodations. Under the subtopic titled "Comprehension Skills," instructors encourage students to develop oral language through listening, speaking, discussion, and responding with newly acquired vocabulary. For example, Activity 1 in Chapter 2 has students read the chapter and write their responses to each question. In Activity 2, the instructor tells students to read the story before working on the experiment. The students listen to the instructor as the instructions are read aloud. Students write their hypotheses about what observations they expect to see concerning water and its behavior on different surfaces. The instructor asks students to observe adhesion or cohesion and to explain the words in terms of what they see.
- The Online Learning Teacher Support section has a resource titled "Archway Literacy and Phonics Program" that will assist emergent bilingual (EB) students with meanings, grade-level science content, and expectations. It is a reference guide that is used with the Archway cards that provide information to help with English language acquisition. For example, Set 3 is titled

Yellow Cards, and students practice blending letters, tracking reading, spelling, and vocabulary words.

- Under the ESL and Reinforcement of the Teacher Textbook, the instructor is prompted to find online videos of the content that is going to be covered to preview. Students may use visual aids to support the reading of texts and understanding of the topic.

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

- Under the Adaptations for Special Populations in the STEAM Activity Guide - Teacher Edition, it states that the English Language Learner (ELL)student might struggle with reading the material. The material does not provide resources for the students' first language.
- Under the Intervention Focus Tutorials in the Online Teacher Support, support for EBs is provided with a web-based intervention tool that covers content for each grade level.
- The Teacher Textbook and the Student Textbook both provide multiple strategies to engage EBs. For example, in the ELL section of the Making Informed Decisions lesson plan in the Teacher Textbook, it says to provide students with time to convert their research findings into their first language. Students use translated keywords (available in Spanish) and create their own first-language keyword review cards. EB students are also provided with the "Archway Literacy and Phonics Program" to assist with vocabulary and grade-level concepts.

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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.

- The Family and Caregiver Guide gives an overview of the program, which includes research-based strategies, family support, and a breakdown of each of the program components.
- The Family and Caregiver Guide has a link in the online materials, and the page in the Teacher Textbook has a guide with the following sections: Program Introduction, Program Components, TEKS, ELPS, Explanation of TEA/SBOE process and [program] approach, Texas Resource Review requirements, Navigation Guide - Online Resource, Information about [program], Progress Monitoring, Family Visits and Teaching Pedagogy - Storytelling and STEAM. Materials provide a glossary that is available digitally and about the “At Home” activities provided in the Student Textbook.
- The Conservation In The Classroom section of the Learn By Doing STEAM Activity Reader Book has students recycle and pick up trash once a month outside the classroom setting. Students work on a conservation activity twice a month at home. Examples of the activities include turning off lights, four-minute showers, and reusing plastic containers.
- The beginning of the Teachers Textbook provides instructors, caregivers, and even students a breakdown of what a traditional lesson plan looks like with details and notes about the section.
- The Student Journal provides students with an optional extra activity. Students take a text passage home and summarize the text to their caregivers. Students think about what information they have learned from the text and explain it to the rest of the class the next day.

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

- Family and Caregiver program guide for grades K-8 can be found in the Online Library. The program guide breaks it down to include program introduction, program components, TEKS for grades K-8, and key terms to review at home for each grade level. There is a section called family visits where families can visit and explore places throughout Texas. Families are to discuss thoughts and views about the content as well as carry conversations about different topics such as How to take care of your health, taking care of pets, and ways to recycle.
- Materials provide resources and strategies for caregivers to help reinforce student learning and development. The NEST Family Videos provides several videos and workbooks to help support them in gaining content knowledge to support their students. Each workbook is provided with a Parent and Teacher guide that has activities and coloring pages that students can complete at home with their parents.
- In the At Home section of the lesson plan, instructors can recommend programs to watch for families at home and report on in class or write about. Caregivers should ask students to make connections between the program and what they learn in class.
- The Student Textbook has a lesson where students must identify global patterns of atmospheric movement and understand how they influence local weather. Students start by reading The Science section over climate and reviewing key vocabulary words. In the Student Focus Exercise, students work together with classmates and instructors to improve difficult language and language structures. The activity ends with students being told to practice reading, writing, and speaking with their guardians at home.

Materials include information to guide teacher communications with caregivers.

- Materials include teacher guidance resources for communicating with caregivers. For example, the Program Guide includes information on engaging caregivers as partners in learning and offers suggestions for establishing a relationship, inviting ongoing communication and partnership, and sharing progress updates. It describes suggestions for ways family members can assist students in content mastery, such as “[The program] ask(s) family members to review all new terms and definitions with students at home and identify how they are useful in their daily lives.” Additionally, it shares the free online materials caregivers have access to. An example is “Digital family access costs nothing: [The program Publishing Inc provides parents digital access to families for all homework assignments and lists of keywords and definitions. [The program] can be booked to run workshops to assist parents and teachers, work together on safety standards and other areas such as literacy, where parents can help students master good practice and science, mathematics and literacy content."
- The Family and Caregiver Guide has a section on family visits. It says: “If it is possible to arrange some family time visiting locations in your area or elsewhere.” Some suggestions of locations include a Texas Park, Texas Coast Wetlands, Texas Fishery, Texas Wildlife Reserve, and a Gulf Coast Beach. Families and instructors should discuss what studies they have completed that relate to these locations and discuss their thoughts and views.
- The Student Reasoning Library in the Scientific, Investigation, and Reasoning Handbook states that they offer a teacher/parent edition so that teachers and parents can work together with the students. Parents and teachers can support each other to help increase student achievement.

- There is evidence of teacher guidance materials that include information on preparing for and facilitating different types of conferences with caregivers based on student needs (e.g., data-driven, student-led, virtual, in-person). Evidence is clear for home visits.
- There is evidence of templates for caregivers to communicate concerns or insights regarding a student's level of understanding, such as forms attached to at-home practice activities, space for input on progress reports, or a message box in the online platform. Teachers can share a progress monitoring page that breaks down student grading by assessment (benchmarks, focus questions, and performance tasks) from the Family and Caregivers Guide. The Learn By Doing STEAM Activity Reader Book provides a guide for caregivers to assist in engaging students to read at home and provides the opportunity for there to be open communication between the teacher and caregiver.

TPS STEAM into Science Grade 8

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, scientific and engineering practices, and recurring themes and concepts.	PM
3	Materials provide review and practice of knowledge and skills spiraled throughout the year to support mastery and retention.	PM

Partial Meets | Score 1/2

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

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

Evidence includes but is not limited to:

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

- There is a TEKS-aligned scope and sequence outlining the order in which knowledge and skills are taught. The scope and sequence is organized by unit and with a description of the time to spend on teaching each unit.
- The scope and sequence is represented in a table format that lists the units with the TEKS strands and the page number. A calendar view is also available that shows the breakdown of units daily. There is evidence of in-depth explanations of the TEKS and how they can be further implemented alongside the ELPS.
- An alternate RTI scope and sequence is provided and aligned with the STEAM Storybooks and other instructor-facing materials.

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

- In the Teacher Textbook, lesson plans provide clear teacher guidance for facilitating activities. There are outlines and descriptions of activities and student action steps. Depth Of Knowledge questions are provided for instructors that accompany the activities. The teacher section outlines training and additional support for the instructor throughout the year.
- In the Learn By Doing STEAM Activity, there is a Design Engineering Process that gives an overview and shows a visual of the design process. There are multiple pieces of evidence of the design process throughout the units. In the Learn By Doing STEAM Activity, there is a Design Engineering Process that gives an overview and shows a visual of the design process. There are

multiple pieces of evidence of the design process throughout the units. In the *Teacher Textbook*, lesson plans provide clear teacher guidance for facilitating activities. There are outlines and descriptions of activities and student action steps. Depth Of Knowledge questions are provided for instructors that accompany the activities. The teacher section outlines training and additional support for the instructor throughout the year. The Content Guide lists Student Expectations, Components, and the lessons with page numbers. The materials do not provide teacher clarity in understanding how activities and experiences connect concepts and SEPs.

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

- The scope and sequence outlines opportunities for reteaching but does not show evidence of skills spiraling throughout the year. Materials provide review and practice of knowledge and skills spiral throughout the year to support mastery and retention in the TEKS 1–5 Content Guide; however, the materials do not support mastery and retention. The materials do not come with a reteach plan or ideas for students that do not master them. It also suggests that "teachers will likely find that the majority of students have mastered the content," which assumes the content does not need to be retaught or reviewed
- There is evidence of spiraling for lab safety and practicing appropriate use of laboratory resources.
- Connections with ELAR content are provided in the introduction with the listed TEKS, but there is no evidence of repetition or spiraling of content-specific TEKS throughout the scope and sequence. Connections with ELAR content are provided in the introduction with the listed TEKS. The TEKS 1–5 Content Guide and amended Scope And Sequence provide details on how TEKS are spiraled. The assessment generator examines student mastery of the TEK. The materials do not include intentional practice and spiraling of previously taught knowledge and skills from earlier lessons/grade levels and the current lesson's science knowledge and skills. The materials do not come with a reteach plan or ideas for students that have not mastered them. It also suggests that "teachers will likely find that the majority of students have mastered the content," which assumes the content does not need to be retaught or reviewed.

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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 grade level.	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 grade-appropriate use of safety equipment during investigations.	M

Partial Meets | Score 1/2

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

Materials provide teacher guidance and recommendations for 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 standards correlations, including cross-content standards, that explain the standards within the context of the grade level. Materials include a comprehensive list of all equipment and supplies needed to support instructional activities. Materials include guidance for safety practices, including the grade-appropriate use of safety equipment during investigations.

Evidence includes but is not limited to:

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

- The Teacher Edition includes guidance and recommendations for phenomenon-based learning, embedded technology, background information, and lesson extensions to support and enhance student learning. Instructors also have access to a support line via phone and email for additional support and questions regarding the materials.
- Located in the *Teacher Textbook*, instructors have access to the Beginning Of Strand document. The document guides instructors how to scaffold assignments to support the needs of students. This guidance includes students with disabilities, advanced learners, and emerging bilinguals. The instructional strategies and scaffolds are research-based.
- The Online Teacher Library includes scaffolds for topics that are TEKS-based. They build upon past learning experiences in prior grade levels.

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

- The Teacher Edition of Learning By Doing gives students the ability to practice ELA-based skills such as comprehension of increasingly complex text and development of oral language through listening and speaking in text-based discussions. Students also practice analyzing data, which uses grade-level math concepts. This indicates clear and international use of applying cross-content standards.
- The Online Library provides lessons and projects that require student research. Students experience phenomenon-based learning with real-world scenarios that provide multiple opportunities to use technology, engineering, art, and math skills. The reading and math skills are partially integrated into assignments and do not always provide explanations for the instructor on how to model these skills.
- The RTI scope and sequence includes science and engineering practices, recurring themes, and concepts listed alongside the content standards. The chapters are TEKS-aligned with summaries of horizontal and vertical alignment.

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

- In the Teacher Textbook, instructors have access to a comprehensive list of materials students need for activities and investigations.
- The Teacher Edition of Learn by Doing STEAM activities: grade six begins with a phenomenon that requires students to use scientific equipment and supplies to connect prior knowledge with a new concept.
- The Real Science Middle School Edition provides students opportunities to apply their knowledge of Science concepts on different activities using a variation of materials. There are activities available for TEKS-aligned concepts.
- The RTI scope and sequence includes a materials list for each activity that is considered hands-on or a lab experience. There are links in the online library that include how to refill material kits.

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

- The investigation section of the *Teacher Textbook* requires the instructor to ensure safety standards are being followed when working with chemicals, equipment, and in the environment in which the investigation will take place. The safety standards must be aligned to local standards as well as TEA safety standards.
- In the *Teacher Textbook*, the laboratory safety section outlines how to create safety assessment plans with students that states instructors should do this prior to each investigation. Specific TEA, local safety standards, or assessment guidelines are not consistently represented prior to each hands-on learning experience. In the *Teacher Textbook*, the laboratory safety section outlines how to create safety assessment plans with students that states instructors should do this prior to each investigation. Specific TEA, local safety standards, or assessment guidelines are consistently represented prior to each hands-on learning experience. Instructors are provided with an embedded checklist with guidance on safety practices and safety equipment usage during investigations.

- The Scientific Method lesson in the Learn By Doing workbook includes some safety tips for hands-on learning as well as general safety. Instructors are provided with checklists for general safety practices and usage of safety equipment.

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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 in a specific order following a developmental progression. Materials designated for the course are flexible and can be completed in one school year.

Evidence includes but is not limited to:

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

- The *Teacher Textbook* provides a detailed scope and sequence with time stamps for the entire unit. In addition, lesson plans list time stamps for the daily lesson. The average lesson time ranges from twenty to fifty minutes.
- Instructors have access to a pacing plan that extends throughout the year. In addition to this pacing plan, there is an RTI-based scope and sequence with time stamps throughout the activity.

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

- The *Teacher Textbook* includes an overview of content and skills to be introduced to students. Scientific concepts, scientific practices, and engineering help instructors build background knowledge and use that to provide students with guided-based inquiries during investigations that include but are not limited to STEM projects and other forms of assessments. In the *Teacher Textbook,* there are lesson plans in place to implement the sequences of the content.
- The content guide for the grade level provides the chapter with corresponding TEKS. The chapters follow a developmental progression, building student content knowledge that follows the scope and sequence.
- The RTI scope and sequence provides specific details on the duration of the units, lessons, and content pacing, as well as sequential chapters. All materials are TEKS-aligned.
- Instructors have access to a flow chart that aids in accessing students' prior knowledge and best practices for the implementation to address gaps in student knowledge. Instructors are also provided with concise, student-friendly objectives and outlines of tasks that can be leveraged to fill in those gaps.

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

- The *Teacher Textbook* provides an instructional calendar that outlines the TEKS and skills addressed in each unit. The projected time to cover all instructional material is one hundred and fifty days.
- The pacing plan provides instructors two weeks' worth of flex days for assessments and reteach options. The RTI lesson plans allow flexibility for reteaching with the instructor choosing which activity aligns best with student needs.

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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.	Yes

Not Scored

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

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

Evidence includes but is not limited to:

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

- Chapter 21 in the STEAM Activity Guide- Student Edition provides students with an appropriate amount of white space. The chapter is designed in a way that uses titles for each section and has graphics to support key concepts.
- Each chapter in the Learn By Doing STEAM Activity Reader - Student Edition has bolded keywords that stand out so that students know the term is important. Activities have space for students to write their responses to questions and graph their responses if needed.
- The Student Journal provides students with plenty of white space to respond to fill-in-the-blank questions and space to create projects based on the questions. For example, the unit on the Electromagnetic Spectrum has space for illustrations for students, space to respond to vocabulary, and space to respond to math and literacy challenges.

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

- Chapter 21 in the STEAM Activity Guide - Student Edition provides graphics that are used to enhance learning and engage the student without being visually distracting. After each step in the activity, students are provided a visual representation of the setup.
- Each chapter in the Learn By Doing STEAM Activity Reader Book has short paragraphs separated by visuals. These visuals are either illustrations, real-life images, or sketches. For example, Chapter 4 has plenty of illustrations to demonstrate Newton's Laws Of Motion. There is space for students to solve for acceleration, complete data tables, solve for force, and create a grid for a graph of their results.

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Materials include digital components that are free of technical errors.

- In the Online Assessment Tools K- 8th Science- Assessment Generator, there are no evident technical errors.
- In the Online Library – STEAM (Science Library), there is no evidence of technical errors.
- The Online Library - NEST Family Videos section has interactive workbooks that students can complete at home and are TEKS-aligned.
- The Online Library - Scientist section provides information on different scientists and their accomplishments. The resources have fact sheets that students can use when researching that scientist.
- Provided links to other resources are fully functional.

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Indicator 9.2

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

1	Materials integrate digital technology and tools that support student learning and engagement.	Yes
2	Materials integrate digital technology in ways that support student engagement with the science and engineering practices, recurring themes and concepts, and grade-level 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.	No

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, recurring themes and concepts, and grade-level content. Materials do not integrate digital technology that provides opportunities for teachers and/or students to collaborate. Materials do not integrate digital technology that is compatible with a variety of learning management systems.

Evidence includes but is not limited to:

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

- The Teacher Program Guide in the Online Teacher Support Section contains a section that outlines all of the digital components of the instructional materials. The guide also provides an overview of materials that can be accessed digitally.
- The STEAM Library in the Online Library has integrated digital technology that supports student learning and engagement, such as the NEST family videos and workbooks. Instructors also have access to the Alaska section in the online library, which provides videos and soundtracks for students to engage with as they learn.

Materials integrate digital technology in ways that support student engagement with the science and engineering practices, recurring themes and concepts, and grade-level content.

- The Teacher Program Guide in the Online Teacher Support section states that the instructor and student will have access to a digital resource called Digital Frog. Students can complete online tours of various environments and collaborate with peers. Instructors and students can also collaborate through the digital software tool that is used for homework assignments.
- The Learn By Doing STEAM Activity Reader Book integrates digital technology to support student engagement while using science and engineering practices. Chapter 1 titled “Fire and Water,”

has students research and explore museums, libraries, professional organizations, private companies, and mentors employed in STEM fields as they learn about different careers.
- The Student Journal integrates digital technology to support student engagement and learning. For example, students engage in the investigation of making informed decisions by evaluating evidence from multiple sources. Students research the claims of Jean-Baptiste Lamarck and compare them to a table to see how credible Lamarck's claims are.
- The STEAM Activity Guide has a cyberspace connection where students research keywords such as journal, scientific predictions, etc.

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

- Materials do not integrate digital technology that provides opportunities for teachers and/or students to collaborate. The two pieces of evidence suggested in the rubric tool are for the students to use the internet for research. Doing research is not a collaboration.
- Materials do not integrate digital technology that supports student-to-student collaboration. Materials do not provide a forum for students to post class discussion topics via written or video responses. Materials do not provide a video conferencing platform or encourage the use of existing platforms for student engagement in group projects and discussions. Materials do not provide interactive games and quizzes students can complete collaboratively in pairs or teams.
- Materials do not integrate digital technology that supports teacher-to-student collaboration. Materials do not provide an online collaborative platform in which teachers and students can share educational materials, create collaborative spaces, post assignments, collaborate on projects, and give immediate feedback to students.

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

- In the Teacher Program Guide of the Online Teacher Support section, the material stated that it integrates digital technology that is compatible with Clever. There is no evidence of other LMSs that support the platform.
- The Alaska section in the Online Library has videos and audio that can be downloaded. Materials can be accessed on an iPad, laptop, and smartphone without difficulty.

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Indicator 9.3

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

1	Digital technology and online components are developmentally appropriate for the grade level 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 grade-level appropriate and provide support for learning.

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

- The Teacher Edition of the STEAM Activity Guide follows the scope and sequence as outlined in the Online Library. The scope and sequence outlines the TEKS that align with the units and show the textbook regencies that support the TEK.
- Each chapter in the Learn By Doing STEAM Activity Reader-Teacher Edition uses strategies such as giving background information with key vocabulary and identifying key concepts so that students can answer TEKS-aligned questions. This format assists students as they work on activities that are aligned with literacy and math.
- The Online Library has a section with famous scientists. The materials align with the expectation that students should know important scientists and their contributions.

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

- The How To Use The Program Guide in the Online Teacher Support section provides a step-by-step process on how to utilize the materials.
- Within the Program Components in the Teacher Program Guide, the instructor is given guidance on how to use technology to support student learning. Materials state that the instructor can use the Online Library Teacher Support - Planning Investigations section to provide the students with information to assist them.

- The Online Library - Teacher Support section has “How to Videos” that assist instructors in generating assessments that support and enhance student learning by using the appropriate tools.
- The Online Library-Assessment Tools K-8 has an Intervention Focus Tutorial that teachers can use to support and enhance student learning, especially for students who are struggling to understand a specific concept.
- The Teacher Program Guide includes a description of all online components.

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

- The Family and Caregiver Guide states that the instructor and caregiver should communicate so that digital access to the curriculum is provided for the student at home. Caregivers are given digital access to homework, TEKS and ELPS, worksheets, and glossary cards.
- The Steam section in the Online Library has integrated with digital technology that supports student learning and engagement. For example, the NEST family videos and workbooks are TEKS-aligned and provide another avenue of engagement and learning.
- The Online Library says all Reader Activity Books are available from at home with digital access, providing caregivers and students the opportunity to practice and learn outside the classroom.