Texas ADI Learning Hub for Science Grade 4

Texas ADI Learning Hub for Science Grade 4
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 3	100%	100%	100%	100%
Grade 4	100%	100%	100%	100%
Grade 5	100%	100%	100%	100%

Section 2. Instructional Anchor

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

Section 3. Knowledge Coherence

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

Section 5. Evidence-Based Reasoning and Communicating

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

Section 6. Progress Monitoring

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

- The materials include guidance that explains how to analyze and respond to data from assessment tools.
- The assessments are clear and easy to understand.

Section 7. Supports for All Learners

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

Section 8. Implementation Supports

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

Section 9. Design Features

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

Section 10. Additional Information

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

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Indicator 2.1

Materials are designed to strategically and systematically integrate scientific and engineering practices, 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.	M
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

Meets | Score 4/4

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 multiple 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 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.
- For example, students have multiple opportunities to design self-guided inquiry investigations. Students design investigations to practice the grade 4 Scientific and Engineering Practices TEKS during "Unit 1: Flotation System for Shipping Containers." Each investigation includes nine or more SEPs. The materials include steps for students to conduct self-guided investigations.
- The materials use phenomena to connect content standards to engineering practices. Each investigation begins by examining a phenomenon in the form of a video, such as mixing various unknown powders into water in "Unknown Powder Identification." Each investigation allows students to reflect on a guiding question, plan investigations, carry out the plan, reflect, and share the results. The investigations allow students to record what they notice and wonder. Students connect ideas about the phenomena to the investigation. Students develop ideas and build on their prior knowledge of magnets throughout the progression of the lesson by reflecting and responding to guiding questions and a progress check-in. In "Stage 3 - Plan" and

"Stage 4 - Do," students collect data regarding unknown powders and then answer the guiding question: "What are your biggest takeaways from this investigation? You may want to mention physical and chemical properties, the structure of particles, the properties of materials, and mathematical calculations." In "Stage 5 - Share," students draft a claim, provide evidence, and justify their analysis. In "Stage 7 - Report," students use academic vocabulary from the lesson to write the report. The teacher uses the report as evidence of mastery.

- The "Report" stage of each investigation allows students to demonstrate mastery of the Science and Engineering Practices TEKS. The "Report" stage in the presentation mode asks students to detail the practices they used to plan and carry out their investigation. For example, in the "Winner! Winner! Hot Dinner!" investigation, the lesson asks students to fill in a report with sentence stems such as "Our goal for this investigation was to figure out…" and "The evidence is based on several scientific ideas. The first one is…."

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

- The "Teacher's Implementation Guide" for grade 4 explains that "Stage 2: Ideas" of the "Argument-Driven Inquiry Model" aims to clearly present concepts and recurring themes "in a way that promotes meaningful sensemaking through reading," but it lacks a further explanation of the opportunities students have to make connections throughout the program. This stage of the lesson frequently highlights a recurring theme and connects it to the overarching scientific core concept students explored during the investigation. Additionally, the "Share" stage of each investigation provides opportunities to make connections to previously taught concepts and supports students in developing and building knowledge.
- For example, in the "Water in the Desert Investigation" in Unit 3, students investigate "how rocks that contain an aquifer are different from rocks that cannot support an aquifer." During "Stage 2: Ideas," students read about the recurring themes of structure and function of systems made of parts. They do this by identifying aquifers as "a system made of different parts all working together to support the aquifer." Throughout the year, materials provide opportunities for students to make further connections between and within concepts using these recurring themes. Examples include the "Water Traveling from Roots to Leaves Investigation" in Unit 4 and the "Pepper Defense Investigation" in Unit 5.
- The grade 4 detailed scope and sequence included in the "Teacher's Implementation Guide" outlines when core ideas (concepts) and recurring themes are used during an investigation, introduced in a lesson, and reinforced from earlier in the year throughout the materials. For example, the document indicates that the "Unit 1: Properties of Matter Investigation" weaves the following core ideas into investigations: "(a) the phenomenon or problem that anchors the activity, (b) what students figure out or problem they solve, and (c) the core ideas that they use to make sense of the phenomenon or to design a solution and the ELPS addressed in each one." Finally, the description includes a cross-content standard alignment for math and ELAR TEKS. This unit also reinforces three recurring themes: patterns, cause-and-effect, and systems.
- For example, the "Adding Water to Other Liquids Investigation" in Unit 1 allows students to explore mixtures and solutions by observing different combinations of substances with water. The "Are All Magnets Conductors of Electricity Investigation" in Unit 2 provides opportunities to explore the physical properties of matter, conductors, and insulators and to use Venn diagrams to make comparisons as outlined in the TEKS. The "Exposed Tree Roots Investigation" in Unit 3 makes connections between core ideas in earth science, such as erosion and weathering, by creating a model.

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

- Materials strategically and systematically develop students' content knowledge and skills by employing a seven-stage instructional model centered on sensemaking opportunities and leveraging investigations and design challenges to teach grade-level content and concepts. The seven stages are "task, ideas, plan, do, share, reflect, report." The "Teacher's Implementation Guide" states: "These seven stages are the same for every investigation and design challenge. Students, as a result, quickly learn what is expected of them during each stage and can focus their attention on learning DC, RTCs, and SEPs." This guidance document also explains that activities in the "reflect" stage support continuous improvement and growth over time, provide multiple practice opportunities with the grade-level SEPs, and help students make connections to current and previous learning. A summary table under the heading "Summary of the Stages of an ADI Investigation" illustrates the activity time and grouping suggestions for each stage to support teachers in breaking investigations up across multiple instructional blocks.
- The materials strategically and systematically develop students' content knowledge and skills as appropriate for the concept and grade level as outlined in the TEKS. Materials embed content from subsequent grade levels into current grade-level investigations. For example, in the "Are All Magnets Conductors of Electricity Investigation," grade 4 students learn to create and identify conductors of electricity in relation to magnets. The investigation also describes conductivity as a precursor to grade 5 content. Similarly, in the "Decomposers in the Soil Investigation," students learn to identify which soils are best for growing a garden. They explore soil property components, including solubility, which aligns with the grade 5 standards.
- The detailed scope and sequence included in the "Teacher's Implementation Guide" shows that materials strategically and systematically develop students' content knowledge and skills by introducing or reinforcing one or more of the following in every investigation: content TEKS, recurring themes TEKS, and scientific and engineering practices TEKS. Materials thereby support students in developing and constructing knowledge and skills across the year.

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 grade 4 "Teacher's Implementation Guide" explains the role of the teacher in the publisher's instructional model, which follows a "content-activity-practice" structure. As stated in the guidance document, "The teacher must act as a resource for the students, rather than as a presenter of information, as students work through each stage of the activity; the teacher must encourage students to think about what they are doing and why they made that decision throughout the process." Additionally, the guide emphasizes that "perhaps most important for the success of these investigations and design challenges, teachers must be willing to let students try and fail, and then help them learn from their mistakes." In line with this philosophy, materials include opportunities for student-led investigations and problem-solving throughout the program. The grade 4 program comprises seven units, each including four or five investigations, on average, along with a design challenge and project interspersed throughout. Each of the seven stages within the instructional model includes opportunities for students to ask questions, plan and conduct investigations, discuss and reflect, and engage in problem-solving.

- For example, the “Flotation System for Shipping Containers Engineering Design Challenge” engages students in problem-solving to make connections across disciplines by requiring them to use measurement and computation skills when constructing their flotation device.
- For example, the “Water in the Desert” investigation has students construct a plan to gather evidence about the solubility of different rocks. They then graph and compare using a bar graph and computation skills.
- For example, the “Unknown Powder Identification” investigation allows students to “figure out the properties of the labeled powders to identify the two unknown powders.” The anchoring phenomenon for the lesson involves observing the mixing of various powdered substances into water. Students can observe the measurement of volume as a mathematical concept.

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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

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 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.

- Materials provide opportunities for students to develop, evaluate, and revise their thinking as they engage in phenomena and define/solve problems. As stated in the grade 4 "Teacher's Implementation Guide," the publisher's instructional model comprises seven stages of classroom activity, which "provide a structure that supports students as they investigate a phenomenon, make sense of that phenomenon, and evaluate and refine ideas, explanations, or arguments." The lessons embed phenomena and problems throughout the program to drive authentic learning as outlined in the grade-level TEKS.
- Each investigation begins with an anchoring phenomenon or a problem in "Stage 1: Task," which supports students in observing a phenomenon or problem, identifying what they need to figure out, and sharing ideas with others. As students continue through the stages of classroom activity, materials build on the anchoring phenomena or problem to support students in constructing, building, and developing knowledge through the application of SEPs, RTCs, and grade-level content. In "Stage 2: Ideas," students engage with texts that highlight core content and recurring themes, and in "Stage 3: Plan," students collaboratively collect data and answer the guiding question posed in "Stage 1." Students then carry out their plans and analyze their data in "Stage 4: Do" before sharing their arguments in "Stage 5," reflecting on and revising their thinking in "Stage 6," and reporting on their learning in "Stage 7."

- For example, in the investigation “Flotation System for Shipping Containers” in Unit 1, “Properties of Matter,” students engage in peer review to explain how the author of the investigation report could improve their investigation as well as suggest changes to the investigation. Students rethink and revise work throughout the instructional model.
- For example, the “Billiards Break Speed Investigation” in Unit 2 begins with a question and a short video of an individual “breaking” on a pool table to disperse the pool balls for the start of a game. The lesson challenges students to design an investigation to “figure out how changing the speed of an object changes the energy of that object.”
- Grade 4 materials also include two opportunities for students to engage in authentic engineering tasks. Materials present engineering design challenges in Unit 1, “Investigation 8, Flotation System for Shipping Container Design Challenge,” and Unit 3, “Investigation 12, Storm Surge Protection Design Challenge.”

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

- Materials leverage students’ prior knowledge and experiences related to phenomena and engineering problems during “Stage 1: Task” in the publisher’s instructional model. According to the grade 4 “Teacher’s Implementation Guide,” students share their prior knowledge of the anchoring phenomenon during the third activity of the task stage. Materials emphasize the importance of this activity as the starting point for student sensemaking in later activities. The guide states, “Teachers can then leverage the prior knowledge and experiences of the students in their classes as a tool to help students figure out how or why something happens in the world around them.”
- Investigations activate prior knowledge by asking students to write and discuss what they noticed and wondered about the introductory phenomenon. For example, in the presentation mode of the investigation "Differences in Duration of Daylight” in “Stage 1: Task,” the activity asks students to do the following: “Before starting this investigation, take a few minutes to think about why there is day and night on Earth. Then draw a picture that shows what causes day and night on Earth in the space below. Be sure to include labels with words to help explain your thinking” In the lesson “Conservation of Matter and Volume,” students view how the volumes and masses of two mixtures change and note things they notice and wonder on a handout.

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

- The “Detailed Scope and Sequence” section of the “Teacher’s Implementation Guide” outlines the scientific concept and goal behind each phenomenon and engineering problem in each investigation within a unit. The document provides a table for each investigation that clearly outlines for the teacher the phenomenon or problem, goal, and core ideas.
- For example, for the design challenge in Unit 1, “Activity 1H,” students address the problem of shipping containers falling off cargo ships and into the ocean. Materials outline the goal: “Students figure out how to create a flotation system that will keep shipping containers from sinking when they fall off a cargo ship during a severe storm. The flotation system must decrease the relative density of the shipping container.” Materials also outline core ideas or specific scientific concepts that students will use during the investigation: 1) different kinds of materials have different properties, 2) systems and system models, 3) describing processes using sequence maps, and 4) how innovative solutions impact science and society.

- For example, the “Winner! Winner! Hot Dinner! Investigation” in Unit 2 identifies three core ideas tied to the problem “How can we transfer the energy from a battery to a light bulb to keep the plate of food warm?” Students apply their understanding of energy stored in batteries, transfer of energy, and tracking the movement of energy in a system to aid them in keeping food warm.
- For example, for the “Comparing Climates Investigation” in Unit 3, the overview table states the following goal: “Students analyze the climate of Jacksonville, Florida, to determine whether it is more like the climate of Washington, D.C. (between Maryland and Virginia), or the climate of Miami, Florida.” Students answer the following question: “Is the climate of Jacksonville, Florida, more similar to the climate of Washington, D.C., or Miami, Florida?” by applying three core ideas: weather and climate, climate zones, and using a Venn diagram to make comparisons.

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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.	PM
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.	PM

Partial Meets | Score 3/6

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

Materials are vertically aligned and designed for students to build and connect some knowledge and skills within and across the units and grade levels. Materials provide some sequencing to scaffold learning in a way that allows for increasingly deeper conceptual understanding. Materials present grade-level-specific core concepts, recurring themes, and concepts, and science and engineering practices. Mastery requirements of some 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.

- Materials support connections within and across grade levels and build from previously learned concepts. For example, the properties of matter investigations in each grade level progress from observing and identifying to measuring, testing, and classifying. In another example, the investigation Flotation System for Shipping Containers builds on TEKS 3.6A and leads to TEKS 5.6A. The investigations support the classification and observation of multiple properties used to classify matter..
- Materials address current grade-level science and engineering learning goals. The Standard's Alignment document for the “Mouth of the Mississippi” investigation states, “Teachers can use this investigation to help students reach any of the 4th Grade TEKS for science listed below.” Within the lesson, the materials provide a Standards document found in the Preparation Documents. These provide an Alignment with the Science TEKS section that provides connections to the prior grade level and the upcoming grade level.
- Materials help students build and connect their scientific and engineering skills. The Detailed 180-Day Scope and Sequence lists each investigation's grade-level science and engineering TEKS. The reflection stage in each investigation provides teachers and students with a deeper understanding by reflecting on ideas to improve their investigations throughout the school year. For example, the first activity in Stage 6 of the “Recession of Glaciers” investigation asks

students, "How can we use what we know about slow changes to the Earth's surface and the movement of glaciers to explain what is shown in this image from a scientific perspective? Discuss some possible explanations in your groups, and then be ready to share your explanations with the rest of the class. Use your handout to keep track of any ideas from the discussion that you think are important to remember or will be useful in the future. " Activity two in Stage 6 of each investigation asks students to, "Think about the tools you used to plan and carry out your investigation and the steps you took to answer the guiding question during this investigation. What things did we do that made us good scientists during this investigation? Talk about this question with the other members of your group."

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

- Materials include some scaffolding in a way that allows for increasingly deeper conceptual understanding. Each investigation follows the same stages with the same student actions. However, the investigations lack adequate scaffolding to support increasingly deeper conceptual understanding in that there are not supportive higher-level questions provided to push students toward deeper understanding. Questions that are provided within the lesson under the pushpin or lightbulb icons are often routine (offered in all of the lessons) or limited in scope and not leading to higher-level thinking and deeper conceptual understanding. For example, in Physical Science: Research Stations in the Arctic, the following questions are provided, "How does the image in the text relate to what we just read? How are the bolded words in the text related to what is shown in the image? How does what we just read provide background knowledge related to the guiding question?" These are also provided in Earth-Space Science: Exposed Tree Roots and most other lessons in the materials.The repetitive nature of these questions does not allow for deeper understanding of the specific concepts.
- The materials do not provide a sequence of phenomena and problems in the Unit Investigations. For example, the materials do not include "Prior to the Unit" and "After this Unit" conceptual guidance in the Teacher Implementation Guide found in the course materials, "Teacher Tips" and "Lesson Plans" in the presentation mode, the "Downloadable Materials" in each investigation, or the "Letter Home" found in the Breakouts.
- The materials include some that are not intentionally sequenced to allow students to develop conceptual understanding. For example, the Physical Science: Sled up a Ramp lesson, Stage 2: Ideas, includes information about balanced and unbalanced forces. The concept of unequal and equal forces is not introduced until the grade 5 TEKS, and the terms unbalanced and balanced forces are not introduced until the grade 6 TEKS.

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

- Materials present grade-level-specific core concepts, recurring themes, concepts, and science and engineering practices. For example, students apply the core ideas used in previous stages of the investigation to complete a report. Students share their learning. Students engage in engineering practices by planning, carrying out their plans, and sharing their results with peers. In the idea stage, students use scientific practices to identify patterns to help them understand the world and make predictions. Students put their findings from this section into the student report handout. This is a continual process that occurs in all of the lesson investigation/design challenges.

- For example, the Unknown Substances Identification investigation lists materials and states the goal of the investigation. Some materials do accurately provide instruction in grade-specific core concepts, recurring themes and concepts, and SEPs, but then focus on concepts that are not appropriate for the grade level. The section Some Ideas You Can Use: Forces in the Sled Up a Ramp investigation accurately describes a force as a push or a pull.
- The materials include references to the RTCs and SEPs. These are referenced and explained in the Standards document located in the Preparation Documents section of each lesson. In the Alignment with Science TEKS section of the Standards document, there is a chart to outline the meaning of each of the RTCs and SEP, how they connect to the RTCs and SEPs in the prior grade, and what RTCs and SEPs the experience is setting students up for in grade 5.

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

- Materials do not define the boundaries when learning targets are introduced, developed, and mastered within the program and what students must master for the grade level or course. While core concepts are provided in the scope and sequence, the materials do not describe what the learner specifically will be able to do to master the objective. For example, Unit 3, Earth and Space, explores appropriate slow changes to the Earth. However, the Earth and Space strand TEKS 3.10A is included only in the Organisms and Environment with structures and function of plants, and not included in the Earth and Space Unit.
- Materials include learning targets, but materials lack teacher guidance for appropriately assessing within the boundaries of the standards for grade-level concepts. Each lesson includes core ideas for the investigation. For example, in the investigation Impact of Natural Resources, the scope and sequence lists natural resources, conservation, disposal, and recycling as the core ideas taught in the lesson.
- The investigations include a “Peer Review Guide and Teacher Scoring Rubric” in the Downloadable Materials; however, the rubrics do not specify what constitutes a “0: Missing; 1: Approaching Performance Expectation; 2: Meets Performance Expectation; 3: Exceeds Performance Expectation”. For example, in the “Powering Amarillo” investigation, the “Peer Review Guide and Teacher Scoring Rubric” lacks a description of the scoring criteria.

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Indicator 3.2

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

1	Materials support teachers in understanding the 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

Materials meet the criteria for this indicator. Materials provide educative 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.

- Materials include TEKS-based lessons that inherently build from previous grade-level TEKS and lay the foundation for future TEKS. Materials provide guidance on which skills and standards students should have mastered in previous grades, how learning will progress in the subsequent grade levels, how to make connections between units, and how concepts build on others. The Teacher Implementation Guide provides horizontal sequencing of lessons to support the development of grade-level content.
- Materials include teacher preparation documents in each lesson, which contain a standards document which contains a section titled Alignment with Science TEKS. This section outlines explanations of the TEKS as well as the vertical alignment of what TEKS are aligned to in the previous and next grades. This supports teachers understanding of vertical alignment across grade levels with grade-level content, RTCs, and SEPs.
- The lessons are TEKS-based and inherently built from previous grade-level TEKS, laying the foundation for future TEKS. Materials include guiding documents that support teachers in understanding how new learning connects to previous and future learning across grade levels. For example, materials have a document that guides teachers in understanding what students have learned to help understand current content and what students will learn based on current

grade level. Materials contain a 180-day Scope and Sequence and Teacher Implementation Guide; materials guide which skills and standards students should have mastered in previous grades, how learning will progress in the subsequent grade levels, and how to make connections between units and how concepts build on others.

- Materials present background knowledge for the teacher in the Idea section of each investigation and include guiding documents that explain how content increases in depth and complexity across investigations and units within the grade level. For example, the Investigation Information and Standards Alignment document gives teachers a list of 4th-grade science TEKS that align with the investigation Are All Magnets Conductors of Electricity in Unit 2, Investigation 4. This document also provides TEKS alignment for ELAR and ELPS. It provides an explanation or other details to support teachers in understanding how the content, themes, and concepts develop across grade levels.

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 include background information for teachers that provides explanations and examples of science concepts. For example, the Idea section in the investigation Sled Up a Ramp describes the cause-and-effect relationship of forces. The investigation examines the effect of changing the size of the ball when dropping it in water. The Teacher Notes and Lesson Plans for each investigation stage (found by clicking the lightbulb and push pin in the top left corner in presentation mode) provide teacher suggestions on how to guide students. For example, the Teacher Lesson Plan in the first activity of Stage 1 in the “Impact of Natural Resources” investigation states, “...The first activity introduces the phenomenon of the investigation. The video showed materials being sorted in a waste facility in Perth, Australia. Have students work in their assigned groups for this activity. Begin the activity by passing out a copy of the "Task" handout to each student. Show this page on a screen so everyone can see it. Read the introduction of the phenomenon out loud and then start the video…”
- Materials contain explanations and examples of common grade-level misconceptions and barriers to student conceptual development outlined in the TEKS. For example, the Information and Standards Alignment Document has a "Possible Student Misconceptions" section for students' potential misconceptions. Also, the “Storm Surge Protection in Texas Coast Homes” investigation’s In-Person Lesson Plan for Stage 2 Progress Check provides suggestions for reteaching, such as, “This final activity provides an opportunity to reteach any concepts students remain confused about from the prior two stages of this design challenge. Specifically, we suggest that you review the following topics with students: Storm surge, The transfer of energy by waves, The relationship between the structure and function of designed objects, and How innovative solutions to problems impact science and society.”
- Materials include support for teachers to develop their understanding of more advanced, grade-level concepts. The Content in Person section, The phenomenon - Page 1 provides teachers with the same concept information given to students in the student handouts for the Ideas Stage Are All Magnets Conductors of Electricity? investigation. Additional sections with the Content in Person header provide directions, such as, “Talk as a table group about what you noticed and wondered as you watched this video. Be ready to share what your group talked about with the rest of the class.” Teacher documents have information about grade-level misconceptions to support teacher subject knowledge.

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

- The Teacher Implementation Guide explains the ADI instructional model's intent and purpose and the program's design. Materials provide a purpose or rationale for the structure and organization of the materials. Materials state the main intent of the program. For example, the Teacher Implementation Guide describes the program's instructional approaches and references the research-based strategies present in each unit. “The Argument-Driven Inquiry Instructional Model” section of the Teacher Implementation Guides states, “The ADI instructional model (Sampson et al., 2009, 2011, 2014, 2015; Sampson & Gleim, 2009; Sampson & Walker, 2012; Walker et al., 2011) was created using the most up-to-date findings on learning and then tested and refined through university-based research in partnership with school districts throughout Texas. As part of this development process, the instructional model was the focus of numerous studies (see Research on ADI) that took place in classrooms over ten years. This instructional model is intended to serve as a guide or a template for creating meaningful, rigorous, and equitable 3D science investigations (such as those in these instructional materials)...”
- Materials provide a framework explaining the main intent or goals of the program. The Teacher Implementation Guide explains the intent and purpose of ADI’s instructional design. The section titled “The Argument-Driven Inquiry Instructional Model” in the Course Materials provides teacher guidance and hints for each stage of the investigation. For example, the Teacher Implementation Guide states, “In this section of the implementation guide, we will explain what happens during each of the seven stages of an ADI investigation. These seven stages are the same for every investigation. As a result, students quickly learn what is expected of them during each stage and can focus on learning new SCIs, RTCs, and SEPs. We will also provide hints (in boxes) for implementing each stage to explain the ADI instructional model. These hints will help teachers encourage productive talk among students, support emerging multilingual students, improve reading comprehension, and improve the quality of feedback during the peer-review process. The hints also include techniques for helping students when they get stuck while developing their draft argument or writing their report.”
- Materials provide an authentic context for students to develop fundamental literacy skills and to learn or apply mathematical concepts and practices. According to the teacher implementation guide, “these investigations create a language-rich learning environment that enables emerging multilingual students to acquire a new language as they learn science.”

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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.	PM
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

Partial Meets | Score 2/4

The materials partially meet the criteria for this indicator. Materials provide some 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, thinking, and acting as scientists and engineers. Materials provide some opportunities for students to engage with grade-level appropriate scientific texts to gather evidence and develop an understanding of concepts. Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying an understanding of scientific concepts. Materials support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle.

Evidence includes but is not limited to:

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

- Materials consistently provide learning activities that support students' meaningful sensemaking through reading, writing, thinking, and acting as scientists and engineers. Each investigation requires students to read in the Idea section. Writing, thinking, and acting as scientists and engineers are present in each investigation's Plan, Share, Report, and Revise sections. For example, students verbally share ideas in the task stage, read in the ideas stage, receive and provide peer feedback during the planning stage, make sense of data in the do stage, and then share and reflect on their learning. However, materials do not define sensemaking or identify students' specific sensemaking behaviors.
- Materials support students acting like scientists and engineers. For example, the students engage in a phenomenon and design an experiment or an engineering challenge. However, the materials lack sufficient engineering opportunities. For example, students engage in only two engineering design challenges during the entire year. Throughout the curriculum, students act

as scientists and engineers collaborating, reflecting, and sharing their ideas with their peers. The framework of the curriculum and progression of investigations consistently present opportunities for reading, writing, thinking, and acting as scientists and engineers.

- Materials allow students to read, write, think, and act as scientists and engineers. All the investigations present questions or phenomena that allow students to reflect and share their thinking by writing. Students deepen their content knowledge by reading science content. Students act like scientists and engineers by sharing their thoughts and findings with peers through multiple representations, such as charts, graphs, claims, and written reports. All of these experiences lead students to various levels of sensemaking.

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

- Materials provide some opportunities for students to engage in purposeful grade-level appropriate scientific texts. However, some scientific text in the materials is not grade-level appropriate. For example, in the investigation, Physical Science: Sled Up a Ramp, Stage 2: Ideas, two sections of scientific text and graphics focused on balanced and unbalanced forces, defining them and providing examples. Unbalanced and balanced forces are not introduced in the TEKS until grade 6 with TEKS 6.7B. These sections of text are not grade-level appropriate. They may create barriers for some students, making it more challenging to gather evidence and develop their understanding of grade-level concepts demanded by the grade 4 TEKS.
- Materials present some opportunities for students to engage with grade-level appropriate texts. However, there are also points where vocabulary within the texts is not grade-level appropriate, which can impede students' abilities to gather evidence and develop an understanding of the grade 4 concepts. For example, in the Physical Science: Energy Transferred by Sound lesson, in Stage 2: Ideas, the materials discuss sound energy and that "vibrations are a type of wave." There is no discussion of the word wave or addressing its multiple meanings, which could make students' understanding of the concept more challenging, particularly for students developing their English proficiency since wave can have at least three meanings. This is not a grade-level appropriate scientific text, as waves used in the lesson are not introduced to students until grade 6, specifically TEKS 6.8C. In another lesson, Physical Science: Are All Magnets Conductors of Electricity? Stage 2: Ideas, discusses properties of matter and includes a graphic that introduces the vocabulary of diffusion and uses the term elasticity to describe flexibility. The word diffusion does not appear as the vocabulary in the TEKS, and the term flexibility is used in the Elementary TEKS. Introducing scientific text and vocabulary that are not grade-level appropriate makes it more difficult for students to understand and master the concepts that are in the grade-level curriculum.

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

- Materials provide students opportunities to engage in various written and graphic modes of communication in the Task, Do, Share, Reflect, and Report sections to support students in developing and displaying an understanding of scientific concepts. For example, students use pre-made graphic organizers to support learning, such as the t-chart in Stage 1.0 downloadable "Moon Phases" investigation materials to help students write notes during the introduction

video visual. Activity 2 of the presentation mode of Stage 1 asks students to "Talk as a table group about what you noticed and wondered as you watched the video. Be ready to share what your group talked about with the rest of the class." The 3.0 template in the downloadable materials allows student groups to plan their investigations.

- Materials provide opportunities for students to engage in similar modes of communication to record and share observations and wonderings, data, arguments, and conclusions in every investigation. For example, In Unit 3, Earth and Space, Investigation 11, Moon Phases, students observe an image showing the pattern that the appearance of the Moon followed in the video they viewed at the beginning of the investigation. In the Plan Stage, diagrams of materials needed for the investigation are available, and a labeled diagram of the argument draft with details to support students.
- Materials include opportunities for students to communicate thinking on scientific concepts in written and graphic modes. For example, students engage in writing a report at the end of every investigation. For example, the first activity in the presentation mode of Stage 6 of the "Comparing Climates" investigation asks students, "How can we use what we know about climate zones to explain what is shown in this image from a scientific perspective? Discuss some possible explanations in your groups, and then be ready to share your explanations with the rest of the class. Use your handout to keep track of any ideas from the discussion that you think are important to remember or will be useful in the future."

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

- Materials provide authentic student engagement and perseverance of concepts through productive struggle while acting as scientists and engineers. For example, the In-Person Lesson Plan in Stage 6 of the "Difference in the Duration of Daylight" investigation states: "The second activity allows the students to share some things they think will be important to do the next time they plan and carry out an investigation with their classmates. This activity intends to help students make a goal for planning and carrying out more productive investigations in the future. To begin this activity, have the students sit in small groups (the groups do not need to be the same as those in previous stages) and show this page on the screen. Then, give the students time to talk in their small groups about how they would answer the question on the screen. Next, invite students to share the ideas they talked about within their groups and add to, challenge, and refine the ideas that others in the class share. Keep asking questions and encouraging students to reach a consensus until they agree on two or three rules or norms to follow the next time they plan and carry out an investigation."
- Materials support students as "practitioners" while they are figuring out (sensemaking) and productively struggle. For example, in the investigation, Winner! Winner! Hot Dinner!, there is a section called What you need to figure out. In this section, the students are challenged to discover how the energy from a battery is transferred to a light bulb to keep the plate of food warm. Also, Each investigation prioritizes students making evidence-based arguments to construct explanations of how and why the phenomena or problem occurs. For example, the Activity 2 Teacher Tips for Stage 6 in the " Decomposers in the Soil" investigation found by hovering over the lightbulb in the top right corner provides the following teacher suggestions: "Below are some examples of talk goals that you can use to help facilitate this discussion and some questions that you can ask the students to help accomplish each goal. Goal 1: Identify strengths in how students planned and carried out their investigation. What were some strengths of how you planned and carried out your investigation? What things did you do when

you planned and carried out your investigation that you feel were scientific? What things did you do when you planned and carried out your investigation that you are proud of and want to share with others? Goal 2: Identify areas for improvement in how students planned and carried out their investigation. What were some weaknesses in how you planned and carried out your investigation? If you were to redo this investigation, would you make any changes to how you planned and carried out your investigation? Goal 3: Create class norms for what makes a strong investigation. What are some things we did during this investigation that we want to make sure to do again in the next investigation? What are some things we did not do in this investigation that we should make sure to do in the next investigation?"

- Materials provide authentic scenarios intended for students to transfer learning to different situations. For example, the investigation, Winner! Winner! Hot Dinner!, guides the student to keep track of any ideas from the discussion that they think are important or will be helpful in the future in a designated space in the Reflect section.
- The ADI instructional model supports students acting as scientists who learn from engaging in phenomena, make sense of concepts, and productively struggle. Every investigation includes a phenomenon for students to wonder about, provides a scenario with a question to investigate, includes something for students to read to make conceptual connections, has students design an experiment, provides opportunities for peer feedback, and then a final report.

Texas ADI Learning Hub for Science Grade 4

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

Meets | Score 4/4

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

Materials prompt students to use evidence to support their hypotheses and claims. Materials include embedded opportunities to develop and utilize scientific vocabulary in context. Materials integrate argumentation and discourse throughout to support students' development of content knowledge and skills as appropriate for the concept and 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.

- Materials prompt students to use evidence to support their hypotheses and claims as they move through the various stages of the ADI instructional model. Students first gather evidence from texts in Stage 2: Ideas. As noted in the Teacher's Implementation Guide, students take notes on evidence that they can later use to justify their arguments. For example, the second activity in Stage 3 of the "Water Traveling from Roots to Leaves" in the Breakouts asks students to "make an investigation proposal or plan for your investigation. Your investigation proposal must include the following information: the observations or measurements you plan to collect, how you will collect those observations or measurements, and how you will analyze the observations or measurements you collect. Work with the other members of your group to create an investigation proposal by filling out your handout…"The third activity in Stage 3: Do involves students using evidence to develop a tentative answer to the guiding question for the investigation or design challenge.
- Materials provide opportunities for students to develop how to use evidence to support their hypotheses and claims by having peers critique in the Report Peer Review and Teacher Scoring Rubric. For example, in Stage 5: Share, students engage in three activities to share their learning and revise their thinking. They first create evidence-based arguments, then share those

arguments with classmates, and finally revise their arguments based on feedback. As noted in the Teacher's Implementation Guide, "the argument that the students create consists of a claim, the evidence they are using to support their claim, and a justification of their evidence." The evidence students use to support their claims consists of the data they collected during the investigation, as well as notes gathered from the text they read in Stage 2: Ideas.

- Materials provide opportunities for students to support their hypotheses and claims. For example, in grade 4, Ice and Bumpy Roads, students first plan what data they will collect and how they will collect it independently without modeling or guidance from the teacher. In stage 4 of the ADI instructional model, students make sense of the data by creating tables or graphs on the downloadable handout. Students use definitions of a claim, evidence, and justification to create a draft argument.

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

- Materials provide opportunities for students to apply scientific vocabulary within context. Each investigation begins with a concrete experience using various materials outlined in the materials or supplies list. The students can apply vocabulary in the Share and Reflect sections.For example, in the ideas stage of the ADI instructional model, in the grade 4 Conservation of Matter and Volume investigation, the materials bold the terms "mixtures," "solution," "solute," and "solvent." Students may use the vocabulary in their written conclusion/argument if guided on what vocabulary to use.
- Materials include opportunities to develop and utilize scientific vocabulary after having a concrete or firsthand experience to which they can contextualize new terms. Each investigation begins with a concrete experience using various materials outlined in the materials or supplies list. The students are then encouraged to use the terms in the Share and Reflect sections.

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

- Materials support argumentation and discourse throughout the year. For example, in the ADI instructional model, students develop a claim and support it with evidence, then defend and support it with evidence in the Share stage. Materials provide opportunities for students to develop how to engage in argumentation and discourse. The Share Report and Peer Review and Teacher Scoring Rubric sections encourage students to defend claims and give critiques in peer groups.
- Materials integrate argumentation and discourse within stages of the learning cycle. The Share Report and Peer Review and Teacher Scoring Rubric sections are present in each investigation, creating a consistent learning cycle for the learner. For example, in Stage 5 of each investigation, student groups create evidence-based arguments and share their arguments with another student, and offer feedback to their peers. This stage ends with students revising their arguments based on what they learned from others. The Do Stage in the Teacher Implementation Guide includes hints for the Share Stage. It states, "One of the best ways to ensure that important ideas spread through the class is to help one or two groups develop a very strong component of their argument. Other groups will see these examples and add a version of them to their own arguments during the argumentation session. For example, help one group make a perfect graph, another group writes out a perfect interpretation of their analysis, and a third group includes a core idea that the other groups are missing in their justification."

Texas ADI Learning Hub for Science Grade 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.

- Materials provide opportunities for students to justify explanations to phenomena and solutions to problems using written and verbal arguments. The Plan, Do, Share, Reflect, and Report sections encourage the students to use evidence to support their claims. Students must design their investigations or engineering tasks in written form and discuss them as a group. For example, in the Stage Overview section of the Teacher Implementation Guide, states that students formulate their arguments after the investigation, share/present and then revise based on feedback; use evidence from working with their groups and from their learning (texts); write about it in the Report stage
- Materials provide criteria for developmentally appropriate arguments to explain a phenomenon or defend a solution. Materials also provide a template and definitions of what a claim, evidence, and justification are for students to engage in argumentation and discourse. Report Peer Review Guide and Teacher Scoring Rubric have the teacher and peers grade the group's overview of the phenomenon, the task and guiding question, and the statement of importance. It also rates the information collected, how the author collected the information, and the coherence of the information gathered. Finally, this section gives specific criteria to analyze the group's argument and the overall presentation of the report.
- Materials allow students to engage in creating claims, supporting their claims with evidence, and justifying and sharing their results. For example, in Stage 6, students discuss the core ideas. They also identify the strengths and weaknesses of their group’s performance during the investigation and set goals to make their next investigation more productive.

Texas ADI Learning Hub for Science Grade 4

Indicator 5.2

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

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

Meets | Score 4/4

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

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

Evidence includes but is not limited to:

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

- Materials provide teacher guidance on anticipating student responses and the use of questioning to deepen student thinking. The materials provide questioning stems for teachers, such as those included in the Teacher Notes found by hovering over the lightbulb in the Do stage of the investigation, which states, "To help students with collecting their data, you may want to consider the following hints: Is there any information on the download that is more important than the other information provided? How do the ideas you read about earlier relate to the information on the download? Is there any information provided on the download that is less important and that you can ignore?"
- The Teacher Implementation Guide includes teacher guidance in anticipating how students might respond and use questions to deepen thinking. For example, in "Stage 6: Reflect, there are questions to guide teachers in virtually any lesson within the program, such as "Would anyone like to add to that idea? Can anyone else give me some examples of that? Can anyone take that idea and push it a little further? Does anyone want to respond to that idea?"
- Materials provide questions to guide student thinking, primarily in the later stages of the lessons. For example, in the Physical Science: Winner! Winner! Hot Dinner! lesson, in Stage 5: Share, when students are revising their draft arguments, the materials state, "If students are not

making claims consistent with those above, you might want to ask them one of the following questions to help guide them toward a more scientifically accurate claim: How does a change in circuit components impact lighting the bulb? Does the energy in the battery heat the food?" These questions guide and deepen student thinking and help students articulate their understanding.

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

- Materials provide embedded support for the teacher in how to scaffold students' development of scientific vocabulary. For example, Activity 1 in Stage 1 in the Breakouts suggests that " Many teachers choose to create a word wall to support students' learning and use of new vocabulary. We suggest also including a picture of any words on the word wall. This will support emerging multilingual students in their language acquisition."
- Materials provide teacher guidance for student use of scientific vocabulary in the Teaching Tips for In-Person Lessons. The tips tell teachers to have students take notes during the activity, encourage students to write down words they think are important and what they think it means, and have students use the space on their handouts to summarize, retell, or rephrase things they read.
- Materials provide general guidance for teachers to develop student use of scientific vocabulary. For example, students engage in phenomena and are presented with a question or problem, prior to the introduction of vocabulary terms. The Grade 4 Teacher Implementation Guide provides tips such as not front-loading vocabulary and using the reflecting stage to focus on the meaning of given terms.

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

- Materials provide teacher support in preparing students for discourse and using evidence to construct claims. For example, the Teacher Implementation Guide provides an explanation of the Share stage of the ADI instructional model and describes three ways teachers can engage students in the discourse during the Share stage. Materials provide teacher guidance to prepare for student discourse by providing lab sheets with sentence stems in the Report section and the Report Peer Review and Teacher Scoring Rubric.
- Materials provide support for teachers in preparing students for discourse. For example, in the Teacher Tips in the Share stage, the materials suggest that teachers "plant different ideas" to make strong arguments to ensure strong examples for discussion. Materials provide teacher questions for supporting student discourse and the use of evidence in constructing written and verbal claims. For example, the "Draft Report" handout in the Report Stage found in the teacher downloadable materials of each investigation includes a template for student reports with sentence starters such as "...This analysis suggests___This evidence is based on several important scientific ideas. The first one is___…"
- Materials provide teacher guidance for giving feedback on student discourse and using evidence to construct claims in the Report Peer Review and Teacher Scoring Rubric.

Texas ADI Learning Hub for Science Grade 4

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

- Materials provide teacher support and guidance to engage students' thinking in various modes of communication throughout the year/course. The Do section provides students with opportunities to collect and analyze data in written and pictorial form. The teacher implementation guide provides best practice tips and how to implement each stage of the ADI instructional model. Stages in the model allow students to share their thinking and find solutions.
- Materials provide teacher support and guidance for facilitating the sharing of students' finding solutions in the Share and Report sections of the curriculum. For example, in the Teaching Tips for In-Person Lessons in the Present Your Draft part of the Share stage, the materials provide facilitation ideas for how students can share their thinking.
- Materials support and guide teachers in facilitating the sharing of students' thinking and finding solutions. For example, the "Draft Argument" handout in the Share Stage found in the teacher downloadable materials of each investigation asks students to "Share your argument with your classmates. Be sure to keep track of any ideas that you can use to revise your argument and make it better in the space below."

Texas ADI Learning Hub for Science Grade 4

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 tools.

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

- Materials include diagnostic assessments for measuring student learning and identifying learning gains in a variety of formats. Assessments have multiple-choice and short-answer formats. Materials include a two-question pdf summative assessment on one standard each. A list of TEKS-aligned assessments grouped by grade level is included in the Breakouts section of the ADI website. Assessments are categorized into three disciplines: Earth Space Science, Life Science, and Physical Science. Each assessment is considered a two-tiered item that includes a multiple choice question or a drag-and-drop question and then a short answer reason where students write to justify the answer to the first question.
- Materials include formative assessments in a variety of formats. Each investigation includes one assessment question and a short response area for students to write their rationale for their answer choice. Each investigation includes a student report reviewed with a peer and teacher rubric.
- Summative assessments for units are provided and feature questions that utilize a variety of formats, including fill in the blank, multiple choice selection, and open-ended response.
- Materials include formal and informal formative assessment opportunities throughout the investigations. For example, the ADI instructional model allows students to informally give and receive feedback in several stages and formally in the “share” stage. Discussion prompts are

included in investigations designed to help teachers check student understanding at key points during instruction. For example, after each stage in the investigation; the teacher conducts a progress check to ask students, “What is your biggest takeaway from this stage of the investigation?” and discuss.

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

- Materials indicate which student expectations are assessed. For example, the assessment Life Science: Structure, Functions, and Processes of Life Summative Assessment states that the assessment is a two-tiered assessment with drag and drop and short answer categories, probing students' understanding of the structures and functions of plants. The detailed scope and sequence provide names of assessments with the TEKS assessed and indicate that there is a summative assessment for each strand.
- The Teacher Implementation Guide features an Assessment Verification Table where teachers can view which standards are assessed within each unit. The table specifies when each standard is assessed through Investigations, Educative Assessments, and Summative Assessments.

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

- Materials provide opportunities to assess engineering practices and concepts. The Scope and Sequence section in the Teacher Implementation Guide includes a color-coded table highlighting TEKS focusing on “educative assessments” in blue and TEKS focusing on “summative assessment” in red. Content and Recurring Theme TEKS are coded blue and red, indicating the materials include assessment items for these TEKS. The ADI instructional model includes ways to assess students on engineering practices for engineering design units and concepts in Investigations. The ADI learning model builds on a recurring way of assessing information in each lesson. Students are required to be assessed in the Report section of each investigation. Each report requires the learner to make claims based on evidence.
- The ADI instructional model includes ways to assess students on engineering practices for engineering design units and concepts in Investigations. The ADI learning model builds on a recurring assessment of information in each lesson. Students are required to be assessed in the Report section of each investigation. Each report requires the learner to make claims based on evidence.
- Throughout investigation activities, students are given multiple opportunities to explore recurring themes and concepts. The “reflect” stage of each investigation provides the opportunity to reflect specifically on the recurring themes present in the investigation. In addition, the report written at the conclusion of each investigation requires students to use both engineering practices and the integrated knowledge of recurring themes and concepts.

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

- Materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem. For example, the assessment Seedlings shows a picture of seedlings sprouting from seeds, then asks the student to write useful evidence needed to observe and measure seed growth. This example was not presented in the investigation, thus requiring the student to apply the knowledge in a novel way.

Texas ADI Learning Hub for Science Grade 4

- Materials include assessment opportunities through the ADI instructional model to apply knowledge and skills to novel contexts. For example, each unit provides a phenomenon and a question to investigate where students apply knowledge and skills to respond. The Teacher's Implementation Guide describes Assessments found in the ADI Learning Hub. For example, the assessment What Occured shows a picture of a dead tree surrounded by green trees. The learner is then asked to write questions that students could ask about the dead tree. This example was not presented in the investigation, thus requiring the student to apply the knowledge in a novel way.
- Materials include assessments that require students to apply knowledge and skills to authentic phenomena or problems. For example, Teacher Tips in Activity 2 of the Report Stage suggests students. "... (2) discuss what counts as quality and why some reports are stronger than others, (3) discuss ways to strengthen a report, and (4) pick up things that they can do to improve their reports. This helps the students learn new ways to organize and present information, which will help them write better on subsequent reports…"The summative student reports for each investigation include assessments requiring students to apply their knowledge and skills to new phenomena or problems.
- Materials include assessments that require students to apply knowledge and skills to a new phenomenon or problem. For example, in the Grade 4 Physical Science: Sled Up a Ramp Investigation, students explore how the surface of the ramp affects the force needed to pull an object up a ramp. Students are given a materials list of Aluminum foil, Bubble wrap, Coarse sandpaper, Felt, String, Pulley connectors, Carts, Washers, Paper clips, and Tracks to create their own investigation. Students are provided graph paper to record their data and create tables or charts. Students create, share, and revise a plan to answer the guiding question by collaborating with other students within and across small groups inside the classroom. Students create, share, critique, and revise an evidence-based argument about what they figured out.

Texas ADI Learning Hub for Science Grade 4

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

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 Teacher Implementation Guide provides a section titled "Assessment." This section provides guidance for teachers in evaluating short answer responses and investigative reports. This section includes a single exemplar of how investigative plans and written arguments should look. Within this section, the materials also discuss the report grading tool within the Learning Hub. This tool includes an analytical rubric with specific criteria to determine whether a student can demonstrate an understanding of the task through evidence in his or her written report.
- Materials for each investigation include a "Report Peer Review Guide and Teacher Report Scoring Rubric." For example, the document asks, "(1. There is a good overview of the phenomenon? o No o Somewhat o Yes 0 1 2 3.(2. The task and guiding question are clear? o No o Somewhat o Yes 0 1 2 3 (3. It is clear why it is important to complete the task. o No o Somewhat o Yes 0 1 2 3..." In the "Grading Student Reports in the Learning Hub" section of the Teacher Implementation Guide, teachers are provided with the following general guidance on scoring the Student Reports: "The report rubric provided in the Learning Hub is on a 0-3 scale; 0 meaning Missing, 1meaning Needs Improvement, 2 meaning Meets Expectations, and 3 meaning Exceeds Expectations. A score of 2, Meets Expectations, is weighted as 100% in the Learning Hub."

- The Teacher Implementation Guide also provides information about how to provide student feedback and the process for how to share that feedback with students through the Learning Hub.

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.

- Materials support teachers' analysis of assessment data. A report grading tool is embedded into the ADI Learning Hub. The Teacher Implementation Guide also includes guidance for assessment tools. It includes directions and guidance for using the assessment tools in the Learning Hub. For example, teachers can score or score and provide feedback to individual students.
- Materials guide teachers' interpretation of the data by stating that it is important to note that the indicators used to score the reports do not change depending on the report. This feature is intentional because it provides educators with a way to track growth in student performance over time. To track growth, a teacher simply needs to compare the scores of a student (or class of students) on two or more investigation reports using the insight tool that is embedded into the ADI Learning Hub.
- Materials provide guidance and tools to support teachers in responding to data to inform instruction. The exit tickets included in the instructional materials are found in the Texas ADI Learning Hub and can be used to identify student misconceptions and guide teacher instruction.

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

- Materials suggest ways to make instructional decisions (e.g., how to group students by concepts that need to be retaught, how to set objectives or goals for crafting an argument, etc.). This can be found in the "Teacher Tips" provided throughout each Investigation listed in the Breakouts section of the website. For example, Grade 3 Keeping Chickens Warm with Light Investigation gives an option for teachers to differentiate instruction by "hav[ing] all the students with the same assigned number meet together in a new group (i.e., all the 1s meet in this part of the room, all the 2s in this part of the room, etc.), so students from different groups can share what they have tried and what they are stuck on and can offer advice. The students can then return to their original groups to share ideas." There is also a tip for multilingual learners stating, "Be sure to intentionally group emerging multilingual students at times with peers who know the same languages as they do and at other times with peers whose English language development is slightly more advanced. Thoughtful grouping that varies throughout an investigation allows emerging multilingual students to benefit from the different linguistic resources of their peers".
- Materials allow teachers to use the data from summative assessments to plan instruction, intervention, and extension. Information gathered from the assessment tools helps teachers plan core instruction. The Embedded Investigation Reports enable educators to see how students improve using the insight tool described in the Teacher Guide.
- Materials include the assessment tools and yield relevant information for teachers to use for planning. For example, teachers can assess responses students submit and use the information for planning. Information gathered from the assessment tools helps teachers when planning differentiated instruction. The Embedded Investigation Reports enable educators to see if specific students need extra support or enrichment.

- Materials include assessment tools that help teachers when planning core science instruction. The two-question assessments in the Breakouts section of the ADI website allow teachers to view student reasoning in their own words to evaluate their understanding of the concept. Question 2 on each assessment states, "Why did you select that answer? Use the space below to explain your thinking".

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

- Materials provide a variety of student resources for teachers to use in responding to performance data. Materials used reflective discussions and Q&A questions that can help drive real-time adjustments and decisions about the next steps. The Learning Hub provides general teacher tips for using the materials in the investigations to address student needs.
- Materials provide a variety of teacher guidance for responding to performance data. The Teacher Implementation Guide explains how to respond to students in various forms of feedback in the Report Score for Assessment Summary Test section and states that students may need extra support or enrichment.
- The Teacher Implementation Guide provides a chart in the Assessment section that explains how teachers can adjust instruction in response to data. This is outlined by specific stages with the ADI model of instruction. This is further broken down into responses for content knowledge, RTCs, and SEPs. For example, in the section for the Plan stage, when referring to RTCs, the materials state, “Use the ‘Important Ideas, RTCs and Practices’ plan stage graphic organizer (see appendix 2). Tell students to write the specific RTC in the space and to talk with their group about how that RTC is important to answering the guiding question.”

Texas ADI Learning Hub for Science Grade 4

Indicator 6.3

Assessments are clear and easy to understand.

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Assessments contain items for the grade level or course that avoid bias. This is shown in the grade level Investigations, which present content and examples fairly and impartially with no impact on student performance based on such factors as a student's home language, place of origin, gender, or race and ethnicity. For example, the assessment, Heater and Light Bulb, clearly shows a circuit that will turn on the heater. In another example, the assessment, Water Cycle Steps, asks which options come after evaporation in the water cycle. There are three answer choices, water vapor condensing, water collecting, and collected water heating. These three answers all happen after evaporation.
- Materials contain items that are scientifically accurate and free from errors. The Downloadable Materials in the ADI Hub provide an accurate and free-from-bias and errors summative "Draft Report" template for students.

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

- Assessment tools use clear pictures and graphics that are developmentally appropriate. For example, the Heater and Light Bulb assessment in Grade 4, shows circuit components that are commonly found in 4th grade circuit investigations. In another example, the water cycle assessment shows a clear diagram of the water cycle with labels. The picture labels clouds, rain, and oceans, in an age-appropriate way for a 4th-grade student.

- Assessments contain pictures and graphics that are developmentally appropriate. For example, the graphics for the Beach Rocks and the Glacier Movement Investigation Q&A Assessment in the ADI Hub utilize clear, developmentally appropriate graphics.

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

- Materials provide guidance to ensure consistent and accurate administration of assessment tools. Q&A question scoring is described in the Teacher Guide. The section titled “Assessment” in the Teacher Implementation Guide provides guidance on formative and summative assessments such as, “Embedded formative and educative assessments are included as part of each investigation and design challenges found in the Texas ADI Learning Hub… to promote and support the learning of DC, RTCs, and SEPs. ”
- Materials include detailed information that supports the teacher’s understanding of assessment tools and their scoring procedures. For example, each 2-question assessment includes a "Target Answer" and a "Target Reason" that gives teachers a sample student answer to help grade and assess student comprehension. The hints for the “Report Stage” give numerous suggestions to ensure consistent grading of reports.

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

- Materials include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned to learning goals. For example, the Summary of the Stages of an ADI Investigation offers different settings for the formative assessments in the stages of an ADI investigation.
- Materials offer accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals. For example, materials provide a text-to-speech feature on the web-based assessment platform, allowing students to hover over the text using a speech symbol cursor and converting it into a digital text read aloud. The menu options located in the top right corner of the immersive reader view are used to configure different settings. A student can choose Text Preferences, Grammar Options, and Reading Preferences.
- Materials include guidance to offer accommodations for assessment tools that allow students to demonstrate mastery of knowledge and skills aligned with learning goals. For example, The “Differentiation of Instruction for Students with Different Needs” section in the Teacher Implementation Guide provides general teacher guidance for “Modifications to Instructional Materials," “Accommodations Embedded into the Instructional Materials," and “Additional Accommodations." For example, the Teacher Implementation Guide suggests using “extended wait time” in the Reflect Stage as a support as well as “assigning a scribe” and “additional time” in the Report Stage.

Texas ADI Learning Hub for Science Grade 4

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

Partial Meets | Score 1/2

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

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

Evidence includes but is not limited to:

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

- Materials include some teacher guidance for scaffolding instruction and differentiating activities for students who have not yet achieved mastery. For example, Activity 1's In-Person Lesson Plan in Stage 6 of the "Ice and Bumpy Roads" investigation" suggests the following: "If it is clear there are students who need clarification on the standards for this investigation, this provides an opportunity to reteach the important knowledge and skills. Specifically, we suggest you review the following topics: How to model slow changes to Earth's surface caused by weathering from ice. How to describe slow changes to Earth's surface caused by weathering from ice. How to explain how factors or conditions impact stability in objects. How to explain how factors or conditions impact change in objects."
- The Teacher Implementation Guide provides general guidance for differentiated instruction, including ways to scaffold learning experiences for students who have not yet achieved grade-level mastery. However, materials do not provide additional resources for targeted instruction and differentiation to support students who have not yet achieved mastery. For example, the Quick Tips found by hovering over the lightbulb in the first activity of Stage 4 in the "Traits of Parents and Offspring" investigation suggests and describes the "two questions, a nudge, and a goal" technique for questioning; however, this strategy lacks scaffolding to address precursory skills, differentiation, and enrichment needed for students who have not yet achieved grade-level mastery. This strategy lacks scaffolding to address targeted differentiation and resources or recommendations for small groups and interventions.
- The Teacher Implementation Guide, in the section "Differentiation of Instruction for Students with Different Needs," includes an "Additional Accommodations" chart for the stages in the ADI

model. This chart includes general strategies for support and enrichment. However, the strategies sometimes appear in both columns. For example, “strategic and flexible grouping appears in columns for support and enrichment in the Ideas, Plan, Do, and Share stages, with no guidance about how teachers might carry out grouping or carry it out differently for students with different needs. Additionally, this section of the guide provides practices that could be implemented strategically with more teacher guidance, but it does not provide activities teachers could use for specific TEKS to help students achieve mastery.

Materials provide enrichment activities for all levels of learners.

- Materials lack guidance for teachers to provide enrichment activities for all levels of learners. Suggestions do not appear in the margins as teacher tips or notes that address the needs of students at all levels or how the materials could be adapted or added to provide enrichment. The Teacher Implementation Guide, in the section “Differentiation of Instruction for Students with Different Needs,” informs teachers that modifications or additional activities should not be provided in lesson materials.
- The Teacher Implementation Guide, in the section “Differentiation of Instruction for Students with Different Needs," provides strategies and practices, not enrichment activities for all levels of learners. The guide states, “The instructional material that is found in the Texas ADI Learning Hub for 3rd Grade Science, therefore, do not include alternative activities, extra challenge, Problems, or lessons . . .Instead, these instructional materials are designed to provide differentiation for students by embedding accommodations right into each investigation.” Throughout this section of the guide, there is a circuitous discussion of the lesson as the enrichment activity and the enrichment activities are the lesson. The lesson provides a singular pathway with no opportunities for students or suggestions for teachers to investigate things outside of what is presented.
- Materials do not suggest engaging enrichment activities (e.g., virtual field trips, game-based concept review games, service learning projects, problem-solving exercises, simulations, real-world scenarios, etc.) to encourage further exploration of science concepts.

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

- Materials do not include recommendations for just-in-time scaffolds to develop productive perseverance of learning at the moment. The scaffolds that are in place do not address learning acceleration and are generally just effective practices to use for overall learning, not specifically targeted to provide just-in-time learning acceleration.
- Materials do not include scaffolds and lack teacher guidance for just-in-time learning acceleration for all students. For example, the Teaching Tips found by hovering over the lightbulb in the first activity of Stage 2 in the investigation "Energy Transferred by Sound" states, "There are many supports for helping students comprehend what they read already embedded into this activity (i.e., activating prior knowledge, providing a shared experience, making connections, synthesizing, and talking with peers)..." These are not scaffolds to support just-in-time learning acceleration to address specific unfinished learning. There is no guidance for adjusting the learning experience just-in-time with additional content or experiences to embed those prioritized skills students may not have finished learning.
- Materials do not ensure that teachers can target instruction to develop precursor skills necessary to access grade-level content as required for just-in-time learning acceleration. The Teacher Implementation Guide does not have a section on accelerated learning or how to

address unfinished learning of the TEKS in prior grades, nor does it provide guidance for how to differentiate lessons to support just-in-time accelerated learning.

- The Teacher Implementation Guide, in the section "Differentiation of Instruction for Students with Different Needs," briefly mentions "just-in-time scaffolds" for multilingual students; however, this differs from providing accelerated instruction. There is no guidance for teachers to provide just-in-time learning accelerating for the TEKS to become aware of how to prioritize prerequisite skills, diagnose students' unfinished learning, or integrate specific just-in-time lessons to address the unfinished learning of those prioritized skills.

Texas ADI Learning Hub for Science Grade 4

Indicator 7.2

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials engage students in the mastery of the content using strategies embedded in the ADI instructional model. Students make observations of phenomena, read texts to support science knowledge at a grade-appropriate reading level, and perform inquiry-based investigations.
- Materials engage students in the content through a variety of instructional approaches. For example, lessons include video clips to introduce and reinforce specific science concepts as well as opportunities for students to engage in inquiry-based learning activities and collaboration with their peers. Materials provide online and in-person modalities to engage students with content. The materials support collaborative opportunities, authentic tasks, opportunities to collect and analyze data, and videos with phenomena.
- The materials include a rubric for engaging in the investigation process. For example, the rubric states: "...The author did a good job of using words to explain what the visual they made shows. o No o Somewhat o Yes 0 1 2 3 4. The author did a good job of using words to explain what the evidence they used meant. o No o Somewhat o Yes 0 1 2 3 5. Is there enough evidence to support the claim? o No o Somewhat o Yes 0 1 2 3 6. The author did a good job of explaining why they think the evidence is important or why they decide to use it…"

Texas ADI Learning Hub for Science Grade 4

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

- Materials support flexible grouping. For example, the Quick Tips found by hovering over the lightbulb in the top left corner of the second activity in the presentation mode of Stage 4 in the revised "Winner! Winner! Hot Dinner" investigation suggests the following: "If students are struggling to make sense of the data, there are a number of ways to help them without telling them exactly what to do. One option is to have a student from each group share what they are doing to analyze their data and anything they are unsure about. Students from other groups can then offer advice. A second option is to have all the students with the same assigned number meet together in a new group (i.e., all the 1s meet in this part of the room, all the 2s in this part of the room, etc.) so students from different groups can share what they have tried and what they are stuck on and can offer advice. The students can then return to their original groups to share ideas…"
- The materials provide instructional grouping support. For example, the teacher guide supports various grouping strategies throughout the ADI instructional model.
- Materials provide such practices as modeled, guided, collaborative, and independent. Each investigation contains a model phenomenon, guided reading, and collaborative design processes. The lessons provide seven sequenced stages for students to practice a routine to work collaboratively in investigations (e.g., Task, Ideas, Plan, Do, Share, Reflect, Report). The Reflect section provides independent work for the learner.
- In another example, the "Teacher Quick Tips" in the second activity of Stage 2 in the investigations provides general guidance such as: "...If you are concerned about students understanding this text because of their scores on past reading comprehension tests, you can read it out loud as they follow along. As you read the text out loud, be sure to stop at each important idea and ask the students to put a star (or other annotation) next to it in the margin of their handout. They can then discuss these ideas in their small groups…"

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

- Materials include such practices as modeled, guided, collaborative, and independent. Each investigation contains a model phenomenon, guided reading, and collaborative design processes. The lessons provide seven sequenced stages for students to practice a routine to work collaboratively in investigations (e.g., Task, Ideas, Plan, Do, Share, Reflect, Report). The Reflect section provides independent work for the learner.
- Materials provide teacher guidance and structures for effective implementation of the multiple types of practices.Materials provide teacher guidance and structures for effective implementation of multiple types of practices. In the "Teacher Quick Tips" in the second activity of Stage 2 in the investigations, materials provide such general guidance as: "...If you are concerned about students understanding this text because of their scores on past reading comprehension tests, you can read it out loud as they follow along. As you read the text out loud, be sure to stop at each important idea and ask the students to put a star (or other annotation) next to it in the margin of their handout. They can then discuss these ideas in their small groups…"
- Materials provide support for collaborative and independent practices. For example, all of the investigations include components that allow students to work with partners or groups and independently at various stages in the lesson.

Texas ADI Learning Hub for Science Grade 4

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

- Materials present information about diverse people and places. For example, the investigation Research Stations in the Antarctic describes phenomena in Antarctica, the lesson Ancient Ecosystem in West Texas, includes information about the Guadalupe Mountain National Park in western TExas, and the investigation Flotation System for Shipping Containers describes phenomena off the coast of Australia. Also, the Stage 1 videos in the presentation mode of lessons include real-world examples and connections through a diversity of communities and places, such as the phenomenon video in the Stations in the Antarctic.
- The materials include a representation of diverse people. In the lesson focused on STEM careers, the Phenomenon section of Stage 1 includes a video of students responding to the prompt, “What do you want to be when you grow up?” There are students of various ages, genders, and racial and ethnic backgrounds. This lesson also includes reference to the book Lab Girl, which is an “autobiography of Dr. Hope Jahren and her interest in science from an early age” that helps female students see themselves in a field of study that has traditionally been dominated by men. Students experience the same video and book reference in grades 3-5.

Texas ADI Learning Hub for Science Grade 4

Indicator 7.3

Materials include listening, speaking, reading, and writing supports 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 supports 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.

- The Teacher Implementation guide contains a section for supporting multilingual students. This section includes scaffolds for each proficiency level from beginning to advanced high. For example, the writing scaffolding states, "Allow students to write in their native language." For Beginning and Advanced high students, materials recommend that teachers "have students make connections to words they write in science and other subjects."
- Materials promote heterogeneous groups as a linguistic accommodation for emergent bilingual students. For example, the teaching tips within the investigations state, "Be sure to intentionally group emerging multilingual students at times with peers who know the same languages as they do and at other times with peers whose English language development is slightly more advanced. Thoughtful grouping that varies throughout an investigation allows emerging multilingual students to benefit from the different linguistic resources of their peers." These notes within the lessons also refer teachers to the implementation guide, which includes appropriate grouping by English language developmental level. For example, at the Beginning level of proficiency, the guide states, "group student with another emerging bilingual student at the advanced or advanced high" level. This scaffolding helps to support emerging multilingual students by participating in group discussions.
- The lessons provide strategies for teachers to support students in developing English Language proficiency. For example, In the STEM Careers lesson, in the Phenomenon Section, the teacher notes state, "During small group interactions, it is important that you support your emerging multilingual students so they are able to participate in group discussions. Make sure to visit

with each group and ask questions directed at the emerging multilingual students that will prompt those students to share their ideas and other important information with their peers."

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

- Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English. For example, in the Teacher Implementation Guide, in the "Differentiation of Instruction for Students with Different Needs" section, Beginning level students should be allowed to write in their first language. This use of the primary language is removed as students progress in their English proficiency.
- Materials encourage teachers to be sure to intentionally group emerging multilingual students at times with peers who know the same languages as they do and at other times with peers whose English language development is slightly more advanced. For example, the materials indicate that it is important to allow students to communicate their ideas in their first language, English, or a combination of the two. The guide provides one example of a claim, evidence, and justification in English and one in Spanish.
- The Immersive Readers allow for the use of a student's first language. They provide an option for translation into several languages, including, but not limited to, Spanish, French, and German.

Texas ADI Learning Hub for Science Grade 4

Indicator 7.4

Materials provide guidance on fostering connections between home and school.

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials provide information to be shared with students and caregivers about the design of the program. ADI units include a caregiver letter that teachers can send that provides guidance to teachers on communications with parents. Materials provide information to be shared with students and caregivers about the design of the ADI program. For example, the breakout link contains a downloadable PDF “Letter Home” in English. The letter provides a general explanation of the investigation and provides non-content question examples.
- Materials provide information to be shared with caregivers to help reinforce student learning and development.
- The parent/caregiver letter provides an overview of the Argument-Driven Inquiry way of Teaching and Learning, and it breaks down the five features of each investigation.
- Materials provide at-home practice activities for caregivers to help reinforce student learning and development. For each investigation, the letter provides the caregiver with what students are expected to do in each stage. It also provides caregivers with expectations they can do at home to help their student, as well as questions to ask, such as “What are you trying to figure out? Can you explain your thinking to me? Why do you think that happens like that?”

Materials provide information to be shared with caregivers to help reinforce student learning and development.

- Materials state in the Publisher Rubric that each lesson will have a caregiver letter that teachers can send. The materials state the caregiver letter can be found in the investigation dashboard for each investigation. To download the caregiver letter, first, click the button titled

"Downloads." Then, click the option "Letter Home." The parent letter gives caregivers an explanation of the TEKS, RTC, and SEPs. The letter provides guiding question stems to ask at home. The letter provides caregivers with an Argument-Driven Inquiry way of Teaching and Learning, and it breaks down the five features of each investigation.

- Materials provide at-home practice activities for caregivers to help reinforce student learning and development. For each investigation, the letter provides the caregiver with what students are expected to do in each stage. It also provides caregivers with expectations of what they can do at home to help their child, as well as questions to ask, such as “What are you trying to figure out? Can you explain your thinking to me? Why do you think that happens like that?”

Materials include information to guide teacher communications with caregivers.

- Materials provide support for communication with caregivers in the teacher implementation guide. For example, the materials tell teachers how to use the safety letter. The safety letter states that teachers must send home a letter for student safety. Materials tell them how to communicate about the safety agreement and have parents sign it.
- Each investigation has its own parent letter home, and it has activities that caregivers can do at home to support students at home.
- Materials provide guidance on communicating with parents and guardians within the “Fostering Connections Between Home and School” section of the Teacher Implementation Guide. Teachers are provided with various suggestions when approaching communication with families. For example, it is suggested that teachers ``gather samples of a student's work” before conferences with a parent or guardian because “this will help to provide examples of the student’s strengths and weaknesses.”

Texas ADI Learning Hub for Science Grade 4

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

Meets | Score 2/2

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

Evidence includes but is not limited to:

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

- Materials provide both year-at-a-glance and detailed overview versions of a TEKS-aligned scope and sequence in the "Teacher's Implementation Guide." These documents list all grade-level TEKS, including content, RTCs, and SEPs.
- The year-at-a-glance scope and sequence outlines the order in which knowledge and skills are taught by numbering units and activities as well as color-coding TEKS to show which are introduced or reviewed and practiced within a unit or activity. For example, TEKS introduced for the first time appear in green font, while TEKS reviewed or practiced appear in purple font.
- The detailed overview scope and sequence provides a more detailed description organized by unit and shows when and where TEKS are introduced and spiraled throughout the materials. Each activity within a unit appears in a table that shows which Science TEKS are introduced and which are "reviewed and reinforced from earlier in the course." This document shows the TEKS alignment for all classroom activities, investigations, and assessments throughout the materials.

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

- The "Teacher's Implementation Guide" provides clear teacher guidance for facilitating student-made connections during various stages of the publisher's instructional model. This guidance appears as text explaining the role of the teacher and students in each stage as well as a blue box with numbered "hints" to support the teacher in implementing each stage. Additionally, the

scope and sequence graphic included in the guidance document shows a year-long progression of core concepts, SEPs, and recurring themes.

- For example, the "Hints for the Plan Stage" box provides teacher guidance for facilitating student-made connections while checking in with small groups planning investigations. Materials direct teachers, "Encourage students to think about how to use the RTCs to help them decide what observations or measurements to collect and how to best make sense of the collected data." The box includes six questions to ask students to encourage them to think about the RTCs while planning their investigations.
- For example, teacher guidance for "Stage 5: Share" emphasizes the role of the teacher in facilitating student discussions as students "share, critique, and refine their ideas." Materials suggest that teachers ask students to "explain how the claim they are presenting fits with DC or an RTC or to explain why the evidence they used is important based on DC or an RTC." Materials further suggest that teachers guide students to ask each other questions, encouraging them to "think about how they know what they know and why some claims are more valid or acceptable in science." The "Hints for the Share Stage" box emphasizes that teachers should have students look at their notes and re-read scientific texts during this stage because "the DCs and RTCs will…make more sense to them at this point in the investigation."
- For example, teacher guidance for "Stage 6: Reflect" lists three topics for whole-class discussion to prompt students to think about what they learned in an investigation or design challenge. The first topic focuses on "the DC the students used during the investigation or design challenge." The second asks students to consider "the use of scientific and engineering practices during the current investigation or design." The third prompts students to explain "how what they figured out during the current investigation or design challenge connects to DC or a RTC(s) that was introduced earlier in the course or during another grade."

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

- Both the year-at-a-glance and detailed overview versions of the scope and sequence included in the "Teacher's Implementation Guide" show that materials review and reinforce knowledge and skills in units throughout the year. Materials spiral content, RTCs, and SEPs both in activities within the same unit and across units throughout the year. In the year-at-a-glance scope and sequence, spiraled knowledge and skills appear in purple font. In the detailed overview scope and sequence, the table for each activity in a unit lists spiraled knowledge and skills under the header "Science TEKS Reviewed and Reinforced from Earlier in the Course."
- The inquiry-based instructional model provides review and practice of knowledge and skills to support mastery and retention. The "Teacher's Implementation Guide" explains that the first activity in the "Reflect" stage "provides an opportunity to review and reteach the content as needed throughout a unit" after students complete an investigation or design challenge. Materials cite research, emphasizing that "this more contextualized approach to reviewing (as well as practicing using the content to make sense of new phenomenon), which intentionally spirals key concepts and ideas throughout the year to support mastery and retrieval practices, supports greater conceptual understanding and retention over time when compared to more traditional, decontextualized approaches."
- For example, in Unit 1, materials provide review and practice with measuring, testing, and recording properties of matter in four investigations and one design challenge. In Unit 2,

materials provide review and practice by demonstrating and describing energy and how it is transformed or transferred in five different investigations.

Texas ADI Learning Hub for Science Grade 4

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.	M
3	Materials include a comprehensive list of all equipment and supplies needed to support instructional activities.	M
4	Materials include guidance for safety practices, including the grade-appropriate use of safety equipment during investigations.	M

Meets | Score 2/2

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 learning. Materials include 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.

- Materials provide teacher guidance and recommendations for use of the online “Learning Hub” in the “Teacher’s Implementation Guide.” Materials include screenshots to support teachers in utilizing the “Learning Hub.” Materials point out that, on the landing page of the “Learning Hub,” teachers can click on the question mark on the top right and find tutorial videos. The “Teacher’s Implementation Guide” also provides guidance for using the immersive reader and translation experiences in the online student reading materials.
- When navigating the online platform, materials provide tips with research-based instructional strategies and scaffolds for each activity within a lesson. Teachers can hover the cursor over the light blue lightbulb icon in the upper-left corner of the screen to bring up teacher notes for the activity. Examples of these teacher tips include but are not limited to the following: instructional strategies, grouping strategies, scaffolds for special populations of students, checks for understanding, and guidance for facilitating student discussions. In “Stage 2: Ideas,” these tips also provide guidance and recommendations for the online student texts included in the program.
- Materials provide teacher guidance and recommendations for using all investigation and design challenge activities, including preparation and use of necessary materials and equipment, in materials and preparation guidance documents corresponding to each lesson in the program.

- For example, the materials and preparation document for the "Unknown Powder Investigation" in Unit 1 includes pictures and labels to support teacher understanding of the materials setup. The document also includes a table listing each item and quantity necessary to do the investigation, a list of safety considerations, and instructions for clean up after completion. The guidance document for the "Sled Up a Ramp" in Unit 2 gives teachers explicit directions for setting up the investigation by following a pictorial guide showing the location of the ramp in relation to the pulley mechanism used. The document for "Water Traveling from Roots to Leaves" in Unit 4 also includes a list of all equipment and supplies, as well as images for reference when setting up the investigation.

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

- The detailed scope and sequence located in the "Teacher's Implementation Guide" includes standards correlations, including cross-content standards, for each activity within each unit throughout the materials. Materials also accompany each investigation with an "Investigation Information and Standards Alignment" guidance document to explain the standards within the context of the grade level. This explanation of standards appears under the "Alignment with Science TEKS" section, which includes a table listing the target TEKS for the lesson and an explanation of each. The table breaks down the science TEKS into the three categories of SEPs, RTCs, and content. These documents also include cross-content standards for both English Language Arts and Reading and Mathematics, along with English Language Proficiency standards.
- For example, the guidance document accompanying the "Water in the Desert Investigation" lists one target TEKS for earth and space and explains each within the context of the investigation and grade level. The lesson introduces standard 4.11(C), which teaches students to "determine the physical properties of rocks that allow Earth's natural resources to be stored there." Materials provide an explanation of the standard: "Each part of the system is structured in such a way that it can carry out a function for the system. Structure describes the physical properties of each part of the system. These properties can include things like the shape, the color, and the materials the part is made of. The parts of an aquifer include the rocks that make up the aquifer layer, the layers above and below the aquifer layer, and the groundwater stored in the aquifer. Each part in the aquifer is structured to function and keep the aquifer working and full of water."

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

- Materials include a grade 4 list of materials needed for the course. The "Equipment and Materials" document can be downloaded from the "Learning Hub," and the "Equipment and Consumables" list includes the equipment or consumable, the quantity needed for the class, and the investigation where the materials are needed.
- Each investigation includes a materials list. For example, the downloadable materials section for the "Unknown Powder Identification Investigation" provides a comprehensive list of all required materials.

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

- The “Teacher’s Implementation Guide” includes a “Safety Acknowledgement” form for students to sign. The document includes the following statement, along with a list of eleven safety rules: “I know that it is very important to be as safe as I can be during an investigation. My teacher has told me how to be safer in science. I agree to follow these 11 safety rules when I am working with my classmates to figure things out in science.” The form also includes a space for a parent/guardian to sign, indicating that they have reviewed the rules with their child.
- The “Teacher’s Implementation Guide” includes teacher guidance for reviewing safety practices with students during “Stage 3: Plan” in each lesson. Materials explain that the first activity in “Stage 3” is a “tool talk,” in which grade 4 students learn about the materials and equipment prior to the investigation, ensuring that they will use them safely and properly. Materials direct teachers to review safety protocols and precautions with students as part of the tool talk. Materials provide grade-appropriate context for the importance of the tool talk during this stage, stating that “students often find it difficult to design a method to collect the data needed to answer the guiding question (which is the goal of the plan stage) when they do not understand what they can and cannot do with the available materials and equipment.” Additionally, “Stage 4: Do” includes the following teacher guidance for safety practices: “Demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards.”
- The “Materials and Preparation” documents accompanying all investigations in the program provide guidance for safety practices, including the grade-appropriate use of safety equipment. Each document includes a “Safety Considerations” section listing recommended safety materials, reminding teachers to review class safety rules prior to beginning, and offering additional safety considerations.
- For example, “Billiards Break Speed” recommends that the teacher use a set routine for distributing and collecting the materials during the investigation and lists such safety considerations as wearing sanitized safety goggles during setup, data collection, and cleanup. It also suggests that students be careful while handling small objects such as marbles, set up a clean space for group work, and wash hands with soap and water when cleanup is completed.

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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 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. The 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.

- Materials support year-long scheduling considerations in the year-at-a-glance scope and sequence included in the "Teacher's Implementation Guide." Materials state that pacing guidance is based on 45-minute daily class periods, and the number of instructional days allocated for each investigation also accounts for the time required to complete assessments. Materials include a table showing an instructional map for a 180-day school year and recommend that teachers be "responsive to the needs of students and modify this plan as necessary by providing more or less time for different learning experiences."
- The pacing guide included in the "Teacher's Implementation Guide" supports scheduling considerations for the number of instructional days recommended for each activity within a unit based on the total number of instructional days available in a school year. Specifically, the pacing guide adjusts the number of days for each activity based on a 180-day, 150-day, and 120-day school year. For example, in Unit 3, materials recommend 5.5 days for the first activity when following a 180-day calendar but only 3.5 days when following a 120-day calendar.
- The "Teacher's Implementation Guide" offers recommendations on the required time for each of the seven stages in an investigation within the section "Summary of the Stages of an ADI Investigation." Materials include a table showing the time allotment for each activity within a stage. As each stage contains one to four activities, materials support teachers in understanding the required time for each activity within a stage, each stage as a whole, and all stages within the investigation. For example, "Stage 1: Task" comprises three activities and requires 25 minutes, while "Stage 2: Ideas" comprises just one activity and requires 20 minutes. The table also shows that the required time for activities in "Stage 5: Share" (50 minutes) and "Stage 7: Report" (60 minutes) is considerably more than the other stages, supporting teachers in planning accordingly.

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

- Materials are organized by TEKS strands and, therefore, sequence content in line with the order of the TEKS. The units progress in order, ensuring students learn about precursor concepts. The units in the materials correspond with the different reporting categories. For example, in Unit 6, students investigate “Patterns of Change in Living Things” before investigating “Walruses in the Arctic.”
- For example, the “Download Materials” section of the “Unknown Substance Investigation” contains a visual map of the recommended sequence of lesson implementation. Investigations build upon previous investigations within various reporting categories. The investigation “Powering Amarillo” lays the foundation for the concepts taught in “Impact of Natural Resources” in “Unit 3: Earth and Space.” Investigations provide a logical sequence of stages from the introduction of the phenomenon to the final student report submission. The materials provide teacher guidance to help students understand the concepts within a unit.
- Within each unit, students engage in several investigations. For example, in grade 4, students have opportunities to design various investigations to explore the properties of matter before engaging in an “Engineering Design Challenge” to apply their knowledge and skills about the properties of matter.

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

- Materials include a pacing guide in the “Teacher’s Implementation Guide,” showing that materials designated for the course are flexible and can be completed in one school year. The document shows that the number of days allotted for activities and units can be adjusted for completion in line with a 180-day, 150-day, or 120-day calendar. The introductory information in the pacing guide explains that the materials assume shorter class periods for more instructional days and longer class periods for fewer instructional days. As such, the table indicates that materials are flexible and can be completed in one school year in accordance with various local contexts.
- The scope and sequence at a glance indicates that teachers may flexibly adjust the number and selection of activities to be completed for each unit. The color coding used to indicate which standards are introduced and which are reviewed for each activity supports teachers in making decisions to complete the materials designated for the course.

Texas ADI Learning Hub for Science Grade 4

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.

- Digital materials include an appropriate amount of white space and overall design that does not distract from student learning by using appropriate space and font size. The white space around the text makes content easy to read and comprehend; margins, edges, and empty spaces around the content are consistent throughout digital materials; materials use similar spacing between sections, equal line height in body text, and adequate spacing between paragraphs (greater than the line height of body text); materials use a limited number of fonts; and color is used intentionally and consistently to guide the user through the content.
- Materials include an appropriate amount of white space and an overall design that does not distract from student learning in the phenomenon section in the Presentation Mode. The presentation view of investigations includes an appropriate amount of white space and does not distract from
- The student's view of materials includes the appropriate amount of white space and does not distract from student learning. Student material PDF documents include titles at the top of the page that are prominent and clear, and the content is organized in a logical progression. For example, the title of the investigation is bolded and in dark blue and larger text and aligned left to clearly separate it as the heading of the document. Each state of the 7 steps of the ADI learning process is clearly labeled in a faint blue label, such as "Task" in the top right corner of materials. All subheadings and information or directions are in black color and easy to read student-friendly language and font. Student responses are noted by clean boxes with faint blue backgrounds to maintain consistency so students always know where to fill in notes.

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

- Materials embed age-appropriate pictures that support student learning and engagement without being visually distracting in the presentation mode. For example, the assessment handouts include age-appropriate graphics that support learning without distractions.
- Materials embed age-appropriate graphics that support student learning and engagement without being visually distracting in the phenomenon section, such as the Stage 1 videos.

Materials include digital components that are free of technical errors.

- Materials contain no spelling or grammatical errors. For example, No spelling errors were found on Pdf documents in the teacher resources for students.
- Materials have limited technical errors for accessing the online platform. The materials download with ease. To protect student data and comply with federal privacy laws (e.g., FERPA), the learning hub automatically logs users out a prespecified amount of time.
- Materials are free of wrong answer sheets to problems. For example, Target Answer and Target Reason observed on two questions "Q&A" Assessments are correct.

Texas ADI Learning Hub for Science Grade 4

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

Not Scored

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

Materials integrate digital technology and tools that support student learning and engagement. Materials integrate digital technology in ways that support student engagement with the science and engineering practices, recurring themes and concepts, and grade-level content. Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate. Materials integrate digital technology that is compatible with a variety of learning management systems.

Evidence includes but is not limited to:

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

- Materials integrate digital technology and tools that support student learning and engagement. For example, the investigations' presentation mode includes features like online videos, reading passages with a font size tool, activities, assessments, and submitting written responses.
- Materials integrate digital technology that supports student learning and engagement. Materials integrate video clips in presentation mode. The presentation mode of the investigations includes teacher guidance by hovering over the lightbulb and pushpin. This guidance includes suggestions for time and pacing and ways to assist students with making observations, asking questions, collecting data, and participating in discussions.
- Materials include support for students reading below grade level or emergent bilingual students. For example, the student materials include an immersive reader tool. Materials are available as PDFs only for teachers to print for students and give to students who need a physical copy of the materials.

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

example, the first activity of Stage 1 in each investigation begins with introducing a phenomenon for students to “figure out." The investigations usually include a short video clip to introduce the phenomenon.

- Materials provide digital tools for students to engage with recurring themes and concepts, and engineering practices. For example, the third activity in Stage 6 of the presentation mode in the Change in Living Things Investigation asks students, “How did you use this recurring theme to help answer the guiding question during your investigation? Have you used this recurring theme in other investigations? If you have, how was the way you used the recurring theme similar to other investigations and how was it different? Talk about these questions with the other members of your group and be ready to share with the rest of the class.” The first activity in Stage 6 asks students to discuss the core ideas.
- Materials include investigations that allow students to engage in science practice and grade-level content. The student dashboard supports the recurring ADI model of learning in each investigation. For example, students design investigations and share results.

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

- Materials integrate digital technology that provides opportunities for teachers and/or students to collaborate. Students receive feedback from the teacher in the student dashboard. Materials include a message feature for teachers to communicate online with students found by clicking on the chat icon at the top right of each slide in the presentation mode of investigations.
- Materials include a share section for each unit to work together digitally and collaborate before submitting the report.
- Materials include opportunities for teachers to respond to student submissions. For example, The "Q&A Without Scores" section under "Educative Assessments" in the 2024 Revised Teacher Implementation Guide provides the following teacher guidance: “The teacher, however, can also use a Q&A as an educative assessment by providing students with feedback. The teacher can then review the answers and provide feedback after the students have submitted their responses.… After viewing the feedback, the student can request to make a new submission.”

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

- Online materials have an accessible online connection through any device with an internet connection. The Learning Hub is compatible with Classlink and Clever. The materials indicate compatibility with a single sign-on program.
- Materials integrate digital technology that is compatible with a variety of learning management systems. Online components, such as Share or Report, have a grading option that can be synced with a district grading tool. In the “Exporting Grades from the Learning Hub” section of the Teacher Implementation Guide, the materials state directions for manually uploading grades, “After grading students' reports and engagement in the Learning Hub you can export those grades from the Learning Hub to be uploaded to your grade book. Navigate to the Finished Investigations section on the main dashboard, locate the complete investigation, and select the View Summary button. Select the Download Grades button. From the dropdown menu select Grades. This will prompt a download of the student grades in a CSV file that you can upload to your Student Grading System.”

Texas ADI Learning Hub for Science Grade 4

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.

- Digital technology and online components are developmentally appropriate for the grade level. For example, the videos in each grade level investigation align with the TEKS and science concepts for that investigation.
- Student materials are developmentally appropriate. For example, students move through the stages of the investigations by clicking the blue proceed bar. Within a stage, students can click an arrow to move to the next screen.
- Digital technology and online components are aligned with the grade-level scope and approach to science knowledge and skills progression. For example, each grade level includes a scope and sequence with a downloadable alignment document. The 180-Day Detailed Scope and Sequence provides Science, Math, and ELAR TEKS and ELPS alignment for the program's online and downloadable components.

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

- Materials provide teacher guidance for the use of embedded technology to support and enhance student learning. For example, the light bulb tips give suggestions on how to effectively conduct the lesson. Embedded technology to support and enhance student learning exists within Investigation through videos.

- Materials support teachers to successfully integrate the technology within the program. The Teacher Implementation Guide gives step-by-step guidance on using various components of the program. For example, the "Q&A Without Scores" section under "Educative Assessments" in the 2024 Revised Teacher Implementation Guide provides the following teacher guidance: “The images below show what a student would see after completing a Q&A in the ADI Learning Hub. The image on the left shows that the Q&A has been reviewed by the teacher. Notice that there is no score associated with the assessment. The student can then click on the view current submission button or the view feedback button. The image on the right shows what the feedback from the teacher might look like. After viewing the feedback, the student can request to make a new submission.”
- Materials include guidance for teachers on various features in the materials. Materials provide support for teachers to successfully integrate the technology within the program. For example, The ADI Learning Hub section of the Revised Teacher Implementation Guide provides guidance on the following topics: “How to create a class and enroll students in the Learning Hub, Assigning an Investigation or Design Challenge, Investigation Handouts and Materials in the Learning Hub Grading Student Reports in the Learning Hub, Grading Q&As in the Learning Hub, Exporting Grades from the Learning Hub, Using Presentation Mode in the Learning Hub Teacher Tips and Lesson Plans Notes in the Learning Hub, and Immersive Reader in the Learning Hub.”

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

- Materials are available to parents and caregivers to support student engagement with digital technology and online components. The parent letters include directions for navigating the Learning Hub and where to find information about the program. For example, each investigation includes a "Letter Home" titled the "Family and Caregiver Guide." The first page is the same for each letter home and explains the ADI process and how to support children through the online navigation bar in the ADI Learning Hub. Page 2 walks parents through each stage of the Investigation and includes time frames, student expectations, how to help at home, and good questions for parents to ask. Pages 3 and 4 include an overview of the TEKS in list format and labeled by subsection (Science and Engineering Practices; Recurring Themes and Concepts). Finally, Page 6 shows a blank table for students and parents to fill in due dates, tasks, and goals to help them stay on track while working through an investigation in class.
- Materials are accessible online through any device, such as a Chromebook, iPad, etc., with internet access.