Kiddom OpenSciEd Grade 7

Kiddom OpenSciEd Grade 7 Executive Summary

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

Grade	TEKS Student %	TEKS Teacher %	ELPS Student %	ELPS Teacher %
Grade 6	81.63%	81.63%	100%	100%
Grade 7	78.85%	78.85%	100%	100%
Grade 8	83.67%	83.67%	100%	100%

Section 2. Instructional Anchor

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

Section 3. Knowledge Coherence

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

Section 4. Productive Struggle

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

Section 5. Evidence-Based Reasoning and Communicating

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

Section 6. Progress Monitoring

- The materials include a variety of TEKS-aligned and developmentally appropriate assessment tools.
- The materials include guidance that explains how to analyze and respond to data from assessment tools.

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- The assessments are clear and easy to understand.

Section 7. Supports for All Learners

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

Section 8. Implementation Supports

- The materials include year-long plans with some practice and review opportunities that support instruction.
- The materials include 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 are designed to strategically and systematically integrate scientific and engineering practices, recurring themes and concepts, and grade-level content 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

The materials meet the criteria for this indicator. 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.

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.

- Each lesson begins with a section labeled "This Lesson," which goes over the investigations and hands-on activities that will take place to answer the investigative question using science and engineering practices.
- TEKS 7.1A states that "students are expected to ask questions and define problems based on observations or information from text, phenomena, models, or investigations." The materials provide multiple opportunities for students to master content and engineering skills under 7.1, such as:
    - In Unit 7.3, Lesson 1, "Metabolic Reactions," a section called "What Students Will Do" combines the TEKS with Science and Engineering Practices. Students ask questions that arise from careful observation of a doctor's note to clarify and seek additional

information about what is going on inside the body of a child that is causing her symptoms.
    - The materials include opportunities for students to refine a model or explanations using models. In the 7.1 lesson, students observe how bath bombs react in water. Students then build upon their data collection and analysis to design a model of a chemical reaction.
    - In Unit 7.3, each lesson begins with a section labeled "This Lesson," which goes over the investigations and hands-on activities that will take place to answer the investigative question using science and engineering practices.
- TEKS 7.1B states that students use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems. The materials ask students to plan a short investigation to determine if the gas produced by bath bombs comes from the original materials or not. Students carry out the investigation in small groups, taking careful mass measurements of the closed and open systems.

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

- Grade 7 materials use the recurring theme of stability and change. Within Unit 7.5, students analyze and interpret data to draw conclusions about how changes affect populations, gather information to clarify claims about change, and integrate qualitative information obtained from tests and media to help maintain and promote the stability of populations in natural systems.
- Students conduct an investigation to produce data to serve as the basis for evidence to determine which combinations (patterns) of substances in a bath bomb cause bubbles of gas to appear (effect).
- Students will construct and present written and oral arguments supported by citing empirical evidence and scientific reasoning that only certain combinations (patterns) of substances (water, baking soda, and citric) result (cause) in the formation of a gas (effect).
- TEKS 7.5B expects students to, "identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems." In Unit 6, Lesson 1, students consider why floods and droughts are happening more often. This lesson elicits students' initial ideas about what could be causing warmer temperatures and how those warmer temperatures could lead to an increase in both droughts and floods. In the following grade, (eighth grade), students will build on this concept as the eighth grade TEKS 8.11B expects students to "use scientific evidence to describe how human activities, including the release of greenhouse gasses, deforestation, and urbanization, can influence climate."
- In Unit 4, Lesson 15, students develop and revise a model to describe how matter cycles among nonliving and living parts of a system as organisms use food for energy. TEKS 7.5E expects students to analyze and explain how energy flows and matter cycles through systems and how energy and matter are conserved through a variety of systems.
- In grade 6–8, students make connections through patterns in how plate movement causes mountains and volcanoes, changes and stability in an ecosystem, as well as cause and effect with forces. The materials have students exploring these recurring themes by building models, analyzing, and explaining concepts.

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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 for grades 6–8 found in the teacher guide build on prior unit content so students make deeper connections with topics throughout the year.
- The materials are designed to develop and build student skills and content knowledge using phenomena appropriate to the grade level as outlined in the TEKS. For example, materials for grades 6–8 use teacher support with the storyline and driving question board (DQB). The units are further organized into lessons with anchoring phenomena and time-stamped parts of the lesson. Each one develops concepts by reading, writing, hands-on labs, and math connections. These conclude with a review and assessment.
- Students' prior ideas and understandings are elicited, valued, and built upon. For example, Unit 6.3 SciEd (Storms unit) provides the foundation for Unit 7.6, Earth's Resources & Human Impact. Students and teachers work together to figure out where to go next, what evidence is needed, and how it will help them answer questions about a larger phenomenon or solve a problem. Students engage in science and engineering practices in meaningful ways to make progress on their questions.
- The Grade 7 units strategically integrate Science and Engineering Practices through Unit questions and hands-on activities that support instruction within each lesson. This practice is outlined in the "What Students Will Do" at the beginning of each lesson. The materials support teachers in developing student content concepts and skills by giving them cues and support within the lessons in the seventh-grade curriculum. For example, materials contain a Teacher's Guide that contains a "Lesson Learning Plan Snapshot" and a "Where We are Going and Not Going" section that explains, describes, and makes connections between the Science and Engineering Practices (SEP) and the development of conceptual understanding.

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.

- Students are provided opportunities to engage with scientific and engineering practices multiple times and in multiple contexts with DQB and anchoring phenomena.
- Students are given multiple opportunities to ask questions, plan and conduct investigations to answer questions, and explain phenomena using appropriate tools and models. For example, students make connections across disciplines through reading, writing, and math skills.
- In Lesson 7.1, "Where is the gas coming from?," students investigate bath bombs, measuring their mass in a closed and open system before and after crushing them and before and after adding them to water. Students conduct an investigation to produce data to serve as the basis for evidence to determine which combinations of substances in a bath bomb cause bubbles of gas to appear. Students argue using evidence about where the gas came from and carry out an investigation to test the flammability of the gas produced by heating water.
- In Unit 5, Lesson 19, students create public service announcements that define a problem, educate others about how the problem is affecting a specific population, and encourage others to take action to be part of the solution. Students communicate information in writing, through drawings, and oral presentations about how even small changes in people's habits or behaviors can have large impacts on the preservation of natural systems over time.
- According to the *Teacher Handbook*, units integrate mathematical understanding and practices that are grade-level appropriate across both math and science standards. Guidance on

mathematical knowledge and practices is provided in the Teacher Background Knowledge for each unit to alert teachers to opportunities to emphasize the connections.

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Indicator 2.2

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

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

Meets | Score 4/4

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

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

Evidence includes but is not limited to:

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

- The materials use phenomena as a central anchor that drives student learning across grade content in each discipline (earth/space, life, physical science). Students examine phenomena using science and engineering practices (SEPs) through the lens of recurring themes. Students develop content knowledge as they work to construct explanations of the phenomena and/or solve engineering problems.
- The phenomena might be a surprising or puzzling phenomenon or one that students need to understand to address a problem, such as predicting and preparing for a violent storm or controlling soil erosion on a farm. These anchoring phenomena are used to draw students into the storyline by presenting the natural challenge of explaining something or solving a problem.
- In Unit 7.1, Lesson 1, "What happens when a bath bomb is added to water?", the anchoring phenomena begins with students observing different kinds of bath bombs and what they do when added to water. Students model and create driving questions about what caused the gas bubbles to appear. Finally, students brainstorm related phenomena where adding a solid to water resulted in gas bubbles appearing and possible investigations that could be done, as well as additional sources that could help answer our questions.

- In grades 6–8, materials embed opportunities for students to investigate phenomena and problems before, during, and after lessons as they construct, build, and develop their knowledge of the grade-level content. For example, in grade 7, students use the phenomena to investigate chemical reactions in a model.

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

- Students' work is anchored in meaningful phenomena or problems that motivate building ideas over time. Students engage in science and engineering practices in meaningful ways in order to explore questions in everyday life. For example, in grade 7, students connect their knowledge of how food is heated. Unit 7.2 starts off with students thinking about how they would heat up food without having typical methods available and make connections to how they have previously used heat, such as with a flame, a flameless heater, or other means they can recall.
- In Unit 7.4, students reflect on what they ate for breakfast which leads to questions about where their food came from, which leads them to consider which breakfast items might be from plants.
- Each unit builds on prior work on SEPs or crosscutting concepts (CCCs) begun in earlier units. For example, in Unit 6, Lesson 6, students are asked to consider what they have learned so far and then share how their understanding of the problems of droughts and floods has changed since they started the investigation.

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

- There is a Teacher Background Knowledge section that provides what is the anchoring phenomenon and why it was chosen for the unit. It also provides the SEPs and focuses that are used in the unit.
- There is a Unit Overview that begins each Unit in grades 6–8. This overview outlines for the teacher the goals and scientific concepts behind the phenomenon and engineering problems in the unit.
- Each lesson plan details what students will do and why, outlines a plan for instruction, outcomes to look for, and future lesson goals. The teacher edition describes the lesson procedures and instructional strategies, including key ideas for teachers to emphasize in each lesson.
- Each lesson provides an overview for the teacher, which includes "what students will figure out," which is a bulleted list of key concepts that students should understand by the end of the lesson.
- The beginning of each unit has an overview for teachers that explains "How students will engage with each of the phenomena," which summarizes how students progress through each part of the unit.
- Materials give guidance to teachers regarding the scientific concepts and objectives underlying each phenomenon and engineering problems that correspond to content concepts across the grade level. Materials provide opportunities for students to build an understanding of grade-level content through unit-level or chapter-level phenomena or problems.

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Indicator 3.1

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

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

Meets | Score 6/6

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

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

Evidence includes but is not limited to:

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

- Materials present content in a way that builds in complexity within and across units and grade levels. In grades 6–8, materials use the science and engineering practices (SEPs) through each unit with hands-on labs that include questioning, building models, and applying them to real-world situations. For example, grades 6–8 use the topic of forces throughout the units and vertically.
- Materials are designed to build and connect student knowledge. For example, the Teacher Background Knowledge for Unit 7.5, “Where does this unit fall within the OpenSciEd Scope and Sequence,” informs us about what this unit is designed to be taught before and after, what Performance Expectations the Unit focuses on, and how Units build across multiple units.
- According to the Teacher Background document in Unit 4, the unit is designed to be taught after students have experienced the Healing Unit and the Inside Our Bodies Unit. As such, work in this unit can leverage ideas about cell structure and function as well as understanding how our bodies break down food molecules into smaller pieces that can be used for different functions. Additionally, this unit uses and builds on the system models and modeling practice that students have developed in earlier units. Prior to this unit, students develop system models within a life science phenomenon in the Healing Unit.

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

- Materials sequence in a way that activates or builds prior knowledge before explicit teaching occurs that allows for increasingly deeper conceptual understanding. For example, in grade 7, materials utilize a Unit Overview for each unit. In Unit 7.7, students begin observing biannual patterns of the Sun setting perfectly aligned between buildings in New York City along particular streets and then connecting, exploring, and trying to explain additional patterns in the sky that they and others have observed. Students draw on their own experiences and the stories of family or community members to brainstorm a list. Students develop both physical and conceptual models, investigate phenomena, and analyze, interpret, and collect data to gather evidence to explain patterns
- In Unit 7.7, Earth in Space, students begin the lesson by considering what patterns they notice in the sky. Students develop models for the Earth-Sun and Earth-Sun-Moon systems that explain some of the patterns in the sky that they have identified, including seasons, eclipses, and lunar phases. They then investigate a series of related phenomena motivated by their questions and ideas for investigations. Finally, they explore scale and develop a model of the solar system and figure out that gravity is the driving force behind the patterns of motion of these objects and the organization of the solar system as well as the driving force behind the organization of more distant systems (galaxies) that we cannot see with unaided eyes from Earth.

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

- Materials clearly and precisely present grade-specific core concepts, recurring themes and concepts, and science and engineering practices. For example, in grades 6–8, the teacher handbook provides teachers with a clear and concise summary of OpenSciEd Instructional Elements that leads students to learn via science instruction. Within this document are important course-specific concepts, recurring themes, and SEPs. The materials also include resources for differentiating lessons for a variety of learners. The materials include student-driven conceptual learning strategies, concrete mathematical applications, and hands-on practice.
- An OpenSciEd unit storyline is a logical sequence of lessons that are motivated by students' questions. It is a science storyline because the questions arise from students' interactions with phenomena. Each step is designed to enable students to make progress on their questions by using science and engineering practices to help figure out a piece of science idea. Each piece they figure out adds to the developing explanation, model, or designed solution. A storyline provides a coherent path toward building a disciplinary core idea and cross-cutting concepts anchored in students' own experiences and questions.
- According to the Middle School Program Overview, the Middle School Program is organized around units that each target a bundle of performance expectations. The program is sequenced to enable units to build on what students have developed in prior units while supporting the development of disciplinary core ideas (DCIs), crosscutting concepts (CCCs), and SEPs coherently across the program. This coherence allows for presenting the concepts in a way that makes sense to students.

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

- Materials include specific learning targets for each grade level. For example, materials provide a lesson plan document that outlines when learning targets are introduced, developed, and mastered within the unit. Also, unit and lesson objectives are shown within the unit overview, with detailed time-stamped instructions on what students will do, figure out, and be assessed on.
- Materials define the boundaries of the main concepts that students must master for the grade level or course. In the final assessment for the Unit, students are prompted to demonstrate mastery by how they were taught in the Unit. Students will explain situations, plan and carry out an investigation, analyze data, and complete STAAR new items type questions.
- Materials provide an assessment system that has five different kinds of assessments embedded in the unit: formative, summative, pre-assessment, self-assessment, and peer-assessment. Each unit's key assessment moments are listed in the Assessment Overview Table as well as the necessary materials and associated keys. The system is grounded in the recommendations of the National Research Council (2014) report, Developing Assessments for the Next Generation Science Standards.

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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

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

Materials support teachers in understanding the 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 some 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 guiding documents that explain how content and concepts increase in depth and complexity across lessons and units within the grade level. For example, grades 6–8 include a teacher guide with a description of the unit.
- Materials outline the horizontal alignment of disciplinary core idea (DCI) progressions throughout the middle school program. Along with the horizontal alignment, the progression of complexity is stated.
- Materials include a teacher handbook explaining how units are organized by which skills and standards students should have mastered in previous grades and how learning will progress in the subsequent grades. There is an OpenSciEd Scope and Sequence that indicates where the unit will fall in the curriculum. It is guided by the Next Generation Science Standards (NGSS) performance expectations as well as the crosscutting concepts (CCCs) and science and engineering practices (SEPs).
- In the Middle School Scope and Sequence document, there is a graphic that shows how overreaching science ideas are organized into bundles corresponding to the 18 units (six per grade), how these units are sequenced, and how units build on what students have figured out so far about the DCIs in these earlier units. Arrows show DCI connections between units,

indicating that the later unit builds directly on what students figure out about the DCIs in the prior unit. The small dots at the top right of each unit also show connections, indicating the science strands the unit builds upon. For example, Unit 7.3 is shaded to represent that the unit emphasizes Life Science, and the dots on its top right indicate that this unit builds on both Life Science and Physical Science ideas from earlier units (6.6., 7.1, 7.2).

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.

- Materials identify common grade-level misconceptions within the lesson information document. Materials in grades 6–8 have a section labeled as “where we are not going.” It states what level of understanding the student should have and what they will not understand through the unit. Throughout the lessons, teachers are provided “Assessment Opportunities.” In this section, the lesson provides guidance to teachers if students don't understand the content. For example, in Lesson 4, Day 1 of Unit 7.2, the Assessment Opportunity explains how to redirect the discussion if students are struggling with articulating the answer to the posed question. These alternate activities are provided in most lessons to support teachers in recognizing barriers to students’ conceptual development and providing a resource for how to overcome these barriers.
- In Unit 7.2, Lesson 2, there is a collaboration section outlined for teachers with guidance as well as explanations and examples. There are suggested prompts and examples for teachers to review with students. There is a supporting emergent multilingual student section that is given to help with students’ conceptual development, guiding teachers on how to help them complete investigations. Materials build toward the performance expectation, which guides teachers on key ideas and what to do in different activities and situations for students.
- Materials contain explanations and examples of science concepts. Color-coded SEPs provide information that guides teachers in identifying what practice is being used in the lesson. For example, in 12.C, Analyze and interpret data on the properties of substances (patterns) before and after substances interact to determine if the chemical reaction that produces gas in a bath bomb also produces another new substance.

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

- The Middle School Program Overview provides the intent and purpose of the instructional program as well as the rationale for unit and lesson design. This document explains the structure of the program as well as the rationale behind the program's scope and sequence.
- The Teacher Handbook explains the program's instructional approach. It provides teachers with an instructional model to follow as they navigate this program. The handbook also provides teachers with explanations of overarching concepts in the program. For example, the Teacher Handbook explains crosscutting concepts and anchoring phenomena, and science and engineering practices, which are three concepts that are at the core of this program.
- The materials provide a purpose or rationale for the instructional design of the program. Materials provide an explanation for why materials are designed the way they are. Materials highlight key features of the instructional design. For example, the teacher handbook includes a page explaining the rationale, routine, and purpose for learning, and lessons are student-centered instead of teacher-centered.

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Indicator 4.1

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

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

Meets | Score 4/4

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

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

- According to the Middle School Program Overview, this program "is a comprehensive middle school science curriculum that empowers students to ask questions, design investigations and solutions, and figure out the interesting and puzzling world. OpenSciEd empowers students to be the knowers and doers of science and develops a classroom in which the ideas heard from peers move thinking forward and develop students' abilities to think, read, write and argue as scientists and engineers."
- In Unit 2, Lesson 6, students get into teams and revise designs for homemade flameless heaters. They develop an initial model to consider how a flameless heater works, then compare their designs with other people and build a Design Question Board (DQB) that will guide subsequent work. Students test their prototypes using a Design Testing Matrix based on proposed criteria and constraints. Students are then asked to reflect on their work with a self-assessment of how well the team works together as engineers and how well they individually met expectations as teammates.

- The Teacher Handbook explains the use of "Storylines" to provide students with a coherent experience that is motivated by the students' own desire to explain something they don't understand or to solve a problem. Materials identify the sequences of activities for students to use sensemaking. Students observe a phenomenon, then must brainstorm, collaborate, collect, organize, and analyze data to include illustrations: "Learners should be motivated to work through the next step in a science unit just as they are motivated to see what happens next in an unfolding story."

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 multiple opportunities for students to engage with grade-level appropriate scientific texts to gather evidence and develop understanding of concepts. For example, in Unit 7.5, Ecosystem Dynamics and Diversity, students read headlines that claim our candy-buying habits could affect orangutan populations in the wild, examine candy ingredients and realize that one ingredient, palm oil, is produced in the same location, read about tropical rainforests in Indonesia being cut down to grow oil palm trees, and wonder how oil palm trees lead to a decrease in orangutan population.

- In Unit 7.8, Lesson 1 of the materials, students read about how Mt. Everest is getting taller and moving to the northeast over time. Students look at the data for four other mountains and find out that they are also changing elevation with some shrinking, model what they think causes a mountain to change in elevation, and brainstorm related phenomena where land near them has changed over time.

- For example, in Unit 7.2, Lesson 5, students read about the temperature of food. Students are put into groups of three and assigned three reading passages: "How hot does food need to get so that people do not get sick? What temperatures cause scald burn injuries? What temperature range makes food enjoyable to eat?" Each group member is assigned one of the readings and reports on that resource to their group. The purpose of this reading is to figure out the temperature range at which they want the food heated by their homemade heaters.

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

- Materials provide multiple opportunities for students to engage in various written and graphic modes of communication to support students in developing and displaying understanding of scientific concepts. For example, in Unit 7.8, students develop a model showing what is happening to different mountains to cause them to change in elevation. Students use images, a story map, and a reading to gather information and carry out investigations.

- In Unit 7.3, students develop and use a model to explain how food is rearranged through chemical reactions, forming new molecules that support growth and/or release energy as this matter moves through the human body. They explain how different subsystems of the body work together to provide cells with what they need to function. In Unit 3, Lesson 3, students plan and conduct an investigation to produce data to determine whether food molecules can travel from one side of a system to the other side, separated by a solid structure with properties

similar to the walls of the small intestine. Students work in groups to draw their representations in their science notebooks. They then examine the qualities of their models as a representation of the small intestine and discuss limitations.

- In 7.2, Lesson 10, students share ideas on a “graffiti board.” Teachers are directed to regroup the class and discuss the consensus. Also, students stop and jot down some of the DQB questions. Student materials include science notebooks to communicate through writing and illustrations.

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 consistently support students to act as scientists and engineers who can learn from engaging in phenomena and engineering design processes, make sense of concepts, and productively struggle. For example, in Unit 7.2, students see that the flameless heater in an MRE can provide hot food to people when typical cooking methods are not available. Students develop an initial model to consider how a flameless heater works but also notice that MREs may not always be a viable solution. Students design a homemade flameless heater and list situations in which that could be useful. After brainstorming criteria and constraints, students design a homemade flameless heater and compare their designs with other people's. Finally, students build a DQB and gather ideas for investigations that will guide their work as we continue designing.
- For example, in Unit 7.4, students brainstorm foods they ate that they think come from plants, animals, or other sources. They taste maple syrup and maple sap and watch a video of sap being extracted from a tree. Students are motivated to review nutrition labels for the plant foods eaten. Students develop a model to explain their findings and come up with questions to form a DQB. Finally, students brainstorm investigations to figure out the answers to questions.
- According to the Teacher Handbook, each unit includes a “making sense” portion. This portion represents the part of the unit where “students try to come up with an explanation, model, or some other reasoning to explain why or how the phenomenon under investigation is happening. The point of this element is for students to voice their initial ideas about the phenomenon, no matter how inaccurate or far-fetched they may be. The purpose is to lay a foundation for the investigations they will conduct throughout the unit that will lead them to a scientific understanding. By trying to make sense of the phenomenon themselves, students generate ideas that lead to questions and theories that they will want to investigate.”
- For example, in Unit 7.5, students are asked how buying candy affects orangutan populations in the wild. They connect the production of palm oil needed for the candy to cutting down trees in the rainforests where orangutans live to designing a way land can be used to support both orangutans and people. Students are asked to apply their findings and ideas to their local communities, such as habitat restoration, monitoring biodiversity, or communicating with stakeholders about the issues.

Kiddom OpenSciEd Grade 7

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 verbal arguments that justify explanations to phenomena and/or solutions to problems using evidence acquired from learning experiences.

Evidence includes but is not limited to:

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

- Materials provide opportunities for students to develop how to use evidence to support their hypotheses and claims. For example, in grade 7, Lesson 2, Day 2, materials provide two examples of claims and prompt students to choose which one is supported by the evidence. The teacher is given prompts to guide student responses. Students are asked to support the claim "Where is the gas coming from" using gathered and analyzed evidence. The teacher is given examples of responses and guidance for giving feedback.
- For example, in Lesson 7.3, students complete the Assessment Diagnosis Task that prompts them to argue, construct an argument, and share a conclusion from their evidence.
- For example, in Unit 1, Lesson 2, students investigate bath bombs and take mass measurements to determine where the gas bubbles come from. After making observations and recording data, students are asked to support the claim "Where is the gas coming from" using gathered and analyzed evidence. The teacher is given examples of student responses and guidance for giving feedback.
- For example, in Unit 2, Lesson 2, students revise an investigation initially designed to see how hot flameless heaters and air-activated hand warmers get to collect additional data that could serve as evidence to support the idea that a chemical reaction is happening when the devices heat up.

Kiddom OpenSciEd Grade 7

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

- Materials include opportunities to develop and use vocabulary after having a concrete or firsthand experience to which they can contextualize new terms. For example, grades 6–8 materials present scientific vocabulary terms using clear photographs, videos, and definitions in student-friendly language. Each unit storyline includes graphic pictures and diagrams. During the experiments, students record evidence that supports their claims during investigations in their science journals. Most lessons include video clips for teachers to provide a deeper understanding of vocabulary and assist with visual examples.
- For example, in Unit 7, where students learn about chemical reactions and matter, the teacher introduces a list of vocabulary words relating to solubility. Next, students are asked to complete a data table with the ingredients of a bath bomb in which they use the words “soluble,” “insoluble,” and “partially soluble” to describe each ingredient.
- For example, in Unit 7, Lesson 10, students carry out an investigation to collect data as evidence of the effect of light interacting with a simulated atmosphere. The teacher asks students to consider the words “scatter,” “transmit,” and “reflect” as they pertain to light.
- For example, materials recommend, “As new scientific terminology is developed with the class, you build a word wall of these ideas. Keeping a visual model, or examples if applicable, next to each word can help students recall the concept associated with the word. Encourage students to contribute ideas for visual representations or to share and display on the class Word Wall their own drawings they made from the previous investigation.”
- For example, in Unit 7.1, a glossary is provided that defines and indicates where new scientific vocabulary is being introduced in each lesson. Students are guided to interpret the words “dissolve, soluble, and partially soluble.” Students work as a class to define scientific vocabulary and complete a matching drag-and-drop activity.

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 develop how to engage in the practice of argumentation and discourse. For example, the Teacher Handbook provides teachers with Questioning Strategies that promote student discourse. These questioning strategies are intended to surface, challenge, and move student thinking forward while fostering a community of science learners. While they are initially intended as questions that teachers can use, if they are incorporated as part of the norms of classroom culture, students will also begin asking these questions of each other.
- For example, in grades 6–8, units use specific types of discussions to help draw out student ideas, negotiate and refine them, and support students in communicating with one another in scientific ways. In Lesson 7.5, students work together to build understanding and discuss the solutions they have acquired from the unit learning experiences in the following ways:
    - Initial Ideas Discussions
    - Building Understandings Discussions
    - Consensus Discussions
- For example, in Unit 8, Lesson 5, students look for patterns in GPS data to examine land movement around Mt. Mitchell and use a physical model to demonstrate that the entire North American plate moves at a constant speed and in a specific direction. The teacher poses the following questions, and students turn and talk to their peers in response: “The peak of Mt. Mitchell (in the Appalachian Mountains) is moving to the west at 2 cm per year. What changes

the deeper you go below Mt. Mitchell, and what do you think is happening to the land at Earth's surface many miles to the west and the east of Mt. Mitchell?"

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 instruction for constructing and presenting a verbal or written argument to problems using evidence acquired from learning experiences. For example, in grades 6–8, all units begin with carefully selected phenomena to anchor a storyline and motivate the development of target disciplinary core ideas, crosscutting concepts, and science and engineering practices. These anchoring phenomena are used to draw students into the storyline by presenting the natural challenge of explaining something or solving a problem. Other phenomena may be introduced at key points in a storyline to maintain interest or push students to delve more deeply.
- For example, in Unit 4, Lesson 4, students conduct an investigation and produce data showing carbon dioxide decreasing and water increasing in the air surrounding plant leaves exposed to light. Students are given three student claims that they must analyze and give written feedback to each student. Students provide evidence to support (or refute) these claims.
- For example, the Communicating in Scientific Ways chart shows how the materials provide students with visible sentence stems to help prompt their communication with one another: "The goal of the Action & Expression principle is to ensure that learners can fully communicate what they know through varied forms of action or expression."

Kiddom OpenSciEd Grade 7

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 throughout the lessons. For example, in Unit 4, Lesson 15, teachers are given an optional lesson to extend learning about matter cycling. Students recall a video they watched about a whale and are asked to consider some questions posed by the teacher. Materials provide the questions as well as the sample student responses.
- For example, in Unit 1, where students are learning how to make informed decisions by evaluating evidence from multiple appropriate sources, "Setting the Stage for Learning" provides teachers with questions to pose to students after reading an article about evaluating evidence.
- For example, in grade 7.2, Lesson 2, Day 2, students use data they collected to support the idea that the flameless heater and the hand warmer both use a chemical reaction. Teachers can access a chart of prompts and student responses under Key Ideas of what to listen for. Examples are, "Do we want as much energy going to these other systems as to our food?" and "Is there a way we could use the arrows to show more and less energy transfer?"

Kiddom OpenSciEd Grade 7

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

- Materials provide embedded supports for the teacher in how to introduce and scaffold students' development of scientific vocabulary. For example, in Unit 4 on Matter Cycling and Photosynthesis, the Teacher Background Knowledge section provides teachers with guidance for developing the unit's word wall. The list of vocabulary words for the unit is presented in a table that indicates when, in the lesson, the word will be introduced or encountered. Materials suggest that students create cards for the Word Wall at the moment, using definitions and pictorial representations that the class develops together as they discuss their experiences in the lesson.
- For example, at the beginning of each unit, there is a list of key vocabulary and in which lesson it should be introduced. Materials direct teachers to add each vocabulary word to the unit's word wall after the class has developed a shared understanding of their meaning: "The Word Wall becomes an ongoing collection of words we will continue to use, including all the words we earn in the unit and possibly a few key words we encounter." It also connects words from other units.
- For example, in the Teacher Handbook, the section Developing Scientific Languages details the approach of embedding vocabulary within the students' experience. It states, "In each lesson, we want students engaging in practices around a question that they feel a genuine need or drive to figure out. Front-loading vocabulary hinders this process and also puts up barriers on emergent multilingual students to engage in class discussions. This approach to vocabulary building doesn't undermine the sensemaking of students, nor defeat the goal of figuring out important science ideas in each lesson. We want to give students a rich opportunity and experience to wrestle with developing these important science ideas before introducing vocabulary to represent an abbreviated description of those ideas."

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

- Materials provide teacher guidance on preparing for student discourse and supporting students in using evidence. For example, in the Teacher Handbook for seventh grade, there are Questioning Strategies to Support Discussions provided. The units suggest four questioning strategies for teachers to use to promote student discourse. These questioning strategies are intended to surface, challenge, and move forward student thinking while also fostering a community of science learners. These strategies are 1) Elicit questions, 2) Probe or clarify questions, 3) Challenge questions, and 4) Questions to support science discourse.
- For example, in Unit 7.2, Lesson 3, teachers are guided to navigate and motivate student discourse with suggested prompts such as, "Let's think back to your test results again and focus on the copper sulfate and aluminum investigation. When we compare what happened with 1 gram of reactants versus 2 grams and 3 grams, what pattern did we see with the temperature when we tested more reactants?" There are sample student responses the teacher can expect to hear. Teachers are provided guidance to motivate moving student knowledge, motivate learning, shift focus, and continue important
- For example, in Unit 7.1, Lesson 1, teachers are guided to develop explicit, shared norms for the learning community before students develop their first classroom consensus model. In the Teacher Handbook, the Consensus Discussions provide teacher strategies for this type of discussion. It explains the process of why students should collectively work towards a common grade-appropriate explanation or model. In grade 7.14, Day 2, students commence in a

"scientist circle" and are prompted by the teacher asking for them to revisit their science journals. Students are looking for data and evidence that would be needed to explain how a tropical fossil could be seen at the top of Mt. Everest. The teacher lesson guide provides prompts suggesting ways the teacher can deepen the discussion and collaboration amongst students. They discuss and take notes in their notebooks.

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

- Materials support and guide teachers in facilitating the sharing of students' thinking and finding solutions with communication in lessons throughout the year. For example, in Unit 7.1, teachers are provided with key ideas to promote discussion, prompts, and example responses to facilitate student thinking and finding solutions, what to listen for in groups, and follow-up questions. Students have consensus discussions to collectively work toward a common explanation or model. Teachers are guided to ask students to offer proposals for a model, explanation, or solution, ask the class who agrees, disagrees, has alternatives, or questions the proposed idea, and ask students to support or challenge models, solutions, and explanations based on input and evidence.
    - For example, in Unit 7.1, Lesson 1, Day 2, examples of expected student responses are followed up with a teacher slide for a Turn and Talk activity. The slide has two questions that build students' understanding. Students read an article and record their responses to the prompts "What are two limitations of using models?" and "What are 2 advantages of using models?" The teacher directs the student to answer assessment questions to ensure understanding of the concept.
    - For example, in Unit 4, Lesson 9, students develop models to explain why sugar is found in maple trees. Students share their models with the class and discuss questions posed by the teacher. Then, students develop initial explanations, while teachers are provided with notes for evaluating responses as well as sample student responses.
    - For example, in the Teacher Tools and Resources, teachers are offered a "Discussion Planning and Reflection Tool." This tool includes a list of questions that teachers can answer as they consider analyzing and reflecting on the lesson in the teacher guide (before the discussion). It also includes questions to consider as they lead the discussion and reflective questions to consider after the discussion has ended.

Kiddom OpenSciEd Grade 7

Indicator 6.1

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

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

Meets| Score 2/2

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

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

- Material consistently provides formative and informal assessment materials. For example, the Assessment Tab includes summative assessments that include formal opportunities to assess student learning.
- The variety of formats includes TEKS and Unit themes assessed with diagnostic benchmarks, lab scoring criteria, evidence notebooks, and Unit Readiness Checks. Formative Unit A/B assessments are available in all units, as well as summative Unit assessments that assess all TEKS.
- Other formative assessments in materials include Lesson Check and Lesson Check on ED at the end of every lesson. Informal assessments are also given throughout the lessons, with student checks for understanding by raising their hand or answering questions verbally. Unit Performance Tasks are included in materials to provide summative assessments
    - For example, in Unit 1, Lesson 14, students apply what they have figured out about properties to explain a related phenomenon (pollution and erosion effects on marble). They carry out an investigation to collect data about what happens when different substances in the air interact with marble. After assigning an article for the students to read about the Taj Mahal, the teacher asks students to plan and carry out an

investigation based on the following questions: “If you combined a sample of calcium carbonate with any of these five substances, how would that provide evidence to support or refute the scientists’ idea that a chemical reaction is occurring between the calcium carbonate and any of them? What evidence would you look for?” Teachers are provided with notes for evaluating student responses.
    - For example, in Unit 1, Lesson 12, on chemical reactions and matter, students develop a model to represent what is happening to particles in three different chemical processes. In an individual assessment, teachers ask students to explain why it could be possible that water is a product of this chemical reaction. Students are also asked to analyze property data and use it to argue whether one of the solids found in the container after the water has been boiled off is a new substance and use molecular models to argue which substance is a possible product in the chemical reaction. Teachers are provided with notes to evaluate student responses.
- In grades 6-8, the teacher handbook states, “The system has assessments embedded in the unit, options for self- and peer-assessment, and multi-component tasks.” One of the five assessments is the pre-assessment. They are in the form of initial models and DQB questions.
    - For example, the teacher facilitates a whole-class discussion by calling on student volunteers to share their noticings and wonderings from the reading, photos, and videos. What is shared is recorded on the class Notice and Wonder poster. Teachers can assess students’ initial questions on Day 2 as the class constructs the Local Hazards poster and the Technologies or Related Solutions poster or on Day 3 as the class constructs the DQB.

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

- Materials include detailed lesson plans that outline how the materials can be used to teach specific concepts and skills and provide guidance on how to assess all of the student expectations.
    - For example, there is a grade 7 TEKS alignment chart that indicates which TEKS are taught and assessed in which units within the lessons. A “Learning Plan Snapshot” is provided for each lesson. This document includes a summary of student expectations for each part of the lesson.
- Materials assess student expectations over the breadth of the seventh-grade science curriculum and indicate which student expectations are being assessed in each assessment.

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

- Materials include assessments that integrate science concepts with recurring themes and concepts.
    - For example, in Grade 7, Lesson 2.31, Water Assessment and Reflection, question number one: In a recent forest fire in a national park, rangers wanted to protect a famous tree from the heat of the fire. Before the fire arrived, they wrapped huge sheets of shiny foil material all around the base of the tree. Using your knowledge of heat transfer, explain how this material protects the tree from the heat of the fire. Requires students to construct an explanation using their understanding.

    - For example, the culminating activity in Unit 2 provides a rubric that is aligned to the SEPs and RTCs of data analysis and systems, respectively.
- Materials include assessments that integrate science and engineering practices with recurring themes and concepts.
    - Materials include “Making Sense of Phenomena,” which is part of a formative assessment outline in all lessons that give students the chance to revisit anchoring phenomena and apply Claims, Evidence, and Reasoning models to demonstrate learning. Remediation for struggling students is given to teachers, which helps students connect investigative phenomena back to anchoring phenomena.
    - For example, at the end of each lesson and unit, there is an evaluation of a model, reexamination of the DQB, and/or assessment document that allows students to make connections and wrap up their learning for mastery.

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

- Materials consistently require students to apply knowledge and skills to new situations. Some questions in the quizzes and tests require the application of knowledge and skills.
    - For example, in the Unit Assessment for Unit 2, students are asked to answer questions about wildfires in a national park using their understanding of conduction, convection, and radiation. Students will need to apply their learning from the heat transfer lab activities to answer these questions.
    - For example, in Unit 4, Exploring Early Earth, Chapter 1, Google Slide Deck provides a checkpoint where students compare and contrast, define and draw their answers in relation to the Chapters Content.
- Materials include lessons that have a driving question that has to be answered by the student in a summative response. The students apply the concept learned to real-world problems, thus helping the teacher assess the learning of the students.
    - For example, the Unit 2 Water Culminating Project states: "The culminating activity is a multi-day simulation in which students design cities resilient to extreme flooding, then respond once disaster strikes. Assuming the roles of different members in the community, they interpret data and design cities that can respond effectively to flooding. What resources can mitigate the effects? How can a city adapt? The situation changes when news of an impending storm arrives, and students are faced with emergency scenarios to which they must now respond. A final reflection helps to synthesize the experience, and students share in a gallery walk. Students consider how the simulation compares to an extreme natural hazard and then take a final assessment of the unit".

Kiddom OpenSciEd Grade 7

Indicator 6.2

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials consistently include information that guides teachers in evaluating student responses. In grade 7 Unit Assessments, there is a Teacher Answer Key provided at the end of the unit. The key provides a rubric for grading responses and how to evaluate the answers that are provided by students. Teachers are provided with Notes for Evaluating Responses after every question. This guidance provides teachers with knowledge of what the student is thinking and how to evaluate based on different responses that could be received.
    - For example, an additional lesson is offered in Unit 4 on ecosystems and matter cycling. By the end of the lesson, students should be able to describe how ecosystems are sustained by the continuous flow of energy and recycling of materials within the biosphere. After students read an article, materials direct teachers to facilitate a classroom discussion by asking students questions and then ensuring students understand the answers. Finally, to assess student understanding, teachers ask students to describe how ecosystems are sustained by the continuous flow of energy and recycling of materials within the biosphere by drawing and explaining a diagram of a food web and describing energy loss at each trophic level. Teachers are provided with a sample, short answer response to guide their evaluation of student responses.

    - For example, as students work through a unit on Earth in space, students use a video simulation to investigate patterns they think might be responsible for the phenomenon, “Manhattanhenge.” To assess student understanding, teachers ask students to explain why Manhattanhenge occurs just twice a year and why each of these days is about the same length of time away (~22 days) from the summer solstice (which is on June 21st, the longest day of the year). Teachers are provided with notes for evaluating responses as well as what to do if students do not identify patterns that they should.
- Materials include follow-up suggestions for formative assessments in the Teacher’s Guide, provide examples of acceptable answers for evaluating student responses, and include suggested teacher actions to address student learning gaps in lessons and units. In grades 6–8, lessons have suggested prompts, sample student responses, and follow-up questions to support teachers with informal and formative assessments.

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 provide guidance and tools to support teachers in responding to data to inform instruction. According to the Teacher Handbook, each unit includes an assessment system that offers many opportunities for different types of assessments that work together to help teachers inform instruction throughout the lessons. Types of assessments include pre-assessments, formative assessments, self-assessments, summative assessments, and peer assessments. Each unit has identified these key moments of assessment and has included them, along with assessment and scoring guidance, in the Assessment Overview Table at the beginning of each Teacher Edition and within the keys and rubrics associated with lessons.
    - For example, in Unit 5, Lesson 3, students are investigating alternatives to palm oil. Materials direct the teacher to lead a discussion based on a series of questions. Materials provide teachers with suggested prompts and sample student responses. Teachers are also given a list of key ideas, what ideas to “listen for,” as well as the learning objective for the discussion.
- Materials provide questions or prompts for teachers to reflect upon while examining patterns in the data.
    - For example, Unit 7.1, Lesson 3, Day 1, provides guidance if students do not include enough details when recording data and observations.
    - For example, in Unit 7.6, Lesson 3, Day 2, the teacher uses probes to listen for how students are making sense of phenomena they observe using the scaled models to study large-scale atmospheric systems.

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

- The information gathered from the assessment tools helps teachers when planning differentiated instruction.
    - For example, the Lesson 7.8 assessment rubric gives teachers guidance to identify if a student has mastered content. The indication of + or ++ determines the level of mastery: if several ideas marked with a + are missing, this may indicate that a student

may be struggling. If several ideas are marked with ++, then this indicates that a student is bringing a deeper understanding.
    - For example, in Unit 7.1, there is a formative assessment opportunity provided that gives teachers guidance on how to differentiate their lessons. For example, materials say, "See scoring guidance in Part 2a of the Assessment or Part 2b of the Assessment. If students struggle with particular items on this assessment, use Item alignment guide to identify related items on the alternate part 2 assessment that could be used for supporting relearning/mastery learning. Each item on the assessment has been aligned with different parts of the performance expectations so the alternate assessment could be used as a reassessment."
- The information gathered from the assessment tools helps teachers when planning core instruction. For example, in Lesson 7.1.14, there is an additional guidance section that suggests ways to make instructional decisions (e.g., grouping students [pairs, small group, individual, and whole class], how to set objectives and suggested prompts to facilitate student discourse, and what skills should be focused on during each section of the lesson).
- Materials provide suggestions for teachers to consider regarding the potential need for whole class review or reteaching. For example, teachers can reference the teacher guide during Unit 7.7, Lesson 1, Day 4. Teachers are given additional guidance to keep students focused on the topic when they have questions and for them to use the DQB for sensemaking.
- Materials include self-reflection questions for teachers to use after analyzing and interpreting data.
    - For example, in Unit 7.6, Lesson 3, Day 2, teacher guidance offers natural resources and extension opportunities. The second two discussion prompts have students share their ideas about natural resources.
    - For example, the teacher assigns students to the different texts based on the considerations below to support accessibility and engagement with the text.

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.
    - For example, in an assessment in Unit 8, students are asked to use supporting evidence to explain how a marine fossil ended up in the Himalayan Mountains and what will happen to that fossil over time. Teachers are provided with what student responses should and could include. Materials provide a variety of student resources for teachers to use in responding to performance data.
    - For example, in Unit 1, students are tasked with developing a model for "What Happens to a Bath Bomb When Put in Water." Teachers are encouraged to assess student understanding and are provided with what to look for in student responses, as well as what to do if student models do not illustrate understanding.
- Grades 6–8 lessons provide direct instruction of science concepts, followed by reviews of application to those concepts, including creating and revisiting the DQB. Materials provide documents to support teachers in developing action plans to document teacher-provided supports designed to accelerate learning and academic growth. Materials suggest ways to reteach through prompts as well as extension activities to deepen understanding.

Kiddom OpenSciEd Grade 7

Indicator 6.3

Assessments are clear and easy to understand.

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Assessments contain items that are scientifically accurate. Formative and summative assessments include assessment items that align with taught objectives and present grade-level content and concepts, science and engineering practices, and recurring themes and concepts in a scientifically accurate way.
    - For example, in Unit 7.1, a lesson assessment contains assessment tasks that have students refer to molecular models that are grade-level appropriate to support their explanations.
    - For example, in Unit 7.5, Lesson 5, Day 1, a formative assessment recalls what happened after the bath bomb investigation (7.1, Lesson 2). The teacher is directed to remind students that odor is a property.
    - For example, in the assessment in Unit 1, Lesson 12, students are presented with atom models, and they must explain how the molecules rearrange to form a new substance during a chemical reaction. The information is presented in a scientifically accurate way and is free from errors.
- Assessments contain items for the grade level that avoid bias. Formative and summative assessments include assessment content and examples in a fair and impartial manner 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, in Unit 7.2, individual assessment items apply to what students learn about sea turtles in danger. Information is given on the assessment task to make it fair for all students.
- For example, in Unit 7.2, individual assessment items apply to what students learn about metabolic reactions. Information about the brown bear's hibernation is given on the assessment task to make it fair for all students.
- For example, the Lesson 7.6 assessment evaluates a student's community without asking details about where and how they live.

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

- Assessment tools use clear pictures and graphics. Images in lessons are authentic photos as well as clearly labeled diagrams to enhance student and teacher guidance.
  - For example, Unit 7.1 uses molecular models that give a clear representation that enhances students' visualization for those who have never seen one or that helps the ELL students to make a connection.
  - For example, in Unit 2, students are asked to develop an initial model to explain: "How does a flameless heater work to heat up food just by adding room-temperature water?" They are provided with a graphic organizer and directed to put drawings of different parts of their model into each shaped organizer.
  - For example, in Unit 7.1, Lesson 4, Day 2, simple graphics are used to display the different substances that make up the lemonade mixes.
- Assessments contain pictures and graphics that are developmentally appropriate.
  - For example, in Unit 7.2, materials contain pictures of sea turtles and graphic organizers that are developmentally appropriate with enough detail for learning the science content but without excessive detail that would overwhelm a middle school student.
  - For example, in Unit 7.1, Lesson 12, Presentation, students evaluate graphic representations of compounds without including chemical equations.
  - For example, in Unit 1, Lesson 14, students are provided with scientific claims about chemical reactions and molecular models to support their claims. Students are asked to use the provided models to support an argument.

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

- Materials provide consistent guidance to ensure consistent and accurate administration of assessment tools.
  - For example, the Teacher Handbook explains that each unit includes an assessment system that offers many opportunities for different types of assessments that work together to help teachers inform instruction throughout the lessons. It goes on to explain each type of assessment offered and how the teacher should use each type of assessment to gauge student progress.
  - For example, the Teacher Handbook gives examples of how to use the DQBs as formative assessments. Also, it relays the two structures that teachers can use during any unit, allowing teachers with flexibility to customize for their local context.
- Materials include detailed information that supports the teacher's understanding of assessment tools and their scoring procedures.

- For example, in the 7.5 Lesson Assessment, teachers are provided with an answer key that includes guidance for scoring written responses and multiple choice questions and provides sample student answers.
- For example, Lesson 7.8 has a distinct section in the Teacher's Guide on assessment that includes an example of a scored performance assessment with an explanation for each of its components.

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

- Materials offer accommodations for assessment tools so that students of all abilities can demonstrate mastery of learning goals. For assessments, materials state, "Some students may benefit from using multiple modalities to show their thinking for any or all of the questions on this assessment. You may consider allowing some students to present their answers verbally with you or another student acting as a scribe to record their thinking on paper. Other students may benefit from using gestures rather than images to describe parts of their models. Some students might also benefit from using manipulatives to represent parts of the model and to support a written or verbal explanation of what's happening in each part of the model. In each case, encouraging students to use multiple modalities to show their thinking creates a clear, accessible, equitable pathway for all students to demonstrate proficiency."
- The Teacher Handbook states that materials provide teachers with guidance on how to adapt the materials for their students; these strategies are discussed in the teacher guide in educative boxes titled "Attending to Equity." These educational boxes are embedded within the lessons in each unit to provide specific and just-in-time support for teachers.
- All seventh-grade Assessments provide a personalized feature that allows the teacher to differentiate assessments for the students based on accommodations.
- Materials provide a drawing feature so students can write or draw on graphics and pictures in an assessment.
    - For example, in the Unit 7.1 assessment, students can draw in the organizer and maps to complete the assessment.

Kiddom OpenSciEd Grade 7

Indicator 7.1

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

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

Meets| Score 2/2

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

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

Evidence includes but is not limited to:

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

- In grade 7, lessons include recommendations for additional guidance to support students who have not yet achieved mastery. Suggested prompts, sample student responses, and follow-up questions are provided if students don't bring up what they noticed happening to help elicit that line of observation. For example, in grade 7, Unit 7.4, Lesson 15, there is an assessment opportunity. It gives guidance on what to do if the student is struggling and suggests added support to complete the assessment task. The assessment encourages students to demonstrate their understanding of key skills and concepts from the unit through multiple different modalities. It suggests providing multiple representations to show their thinking for all students to demonstrate proficiency.
- The teacher handbook includes strategies for supporting equitable participation during instruction. For example, “in eliciting initial ideas or initial questions, the goal is to get as many ideas on the table as possible. Consider asking students to “write and pass” a sheet of paper around their group until they have at least ten items. That way, all students get a chance to contribute, to see others’ ideas, and to add their thinking in a low-stakes way. Make sure to let students know that these ideas can be expressed in different ways (e.g., pictures, graphs) and that they are not limited to words in English.”
- Materials ensure that teachers can target instruction to reteach skills necessary to access grade-level content and “attend to equity.” For example, in grade 7, lessons include recommendations for additional guidance to support students who have not yet achieved mastery. Suggested prompts, sample student responses, and follow-up questions are provided if students don't bring up what they noticed happening to help elicit that line of observation. In Unit 7.4, Lesson 15, the assessment opportunity guides the teacher on how to support students to complete the

assessment task and demonstrate their understanding of key skills and concepts from the unit through multiple different modalities. It suggests providing multiple representations to show their thinking for all students to demonstrate proficiency.

Materials provide enrichment activities for all levels of learners.

- Materials are designed to promote equitable access to high-quality science learning experiences for all students. The materials include enrichment activities that contain challenging activities and assignments that extend beyond the regular curriculum and stimulate critical thinking, problem-solving, and creativity. For example, in Unit 7.5, Lesson 1, an extension opportunity is offered to support students in better understanding plantation systems over time compared to farms, with a particular look at labor practices and the enslavement of people.
- In Unit 7.5, Lesson 12, an extension opportunity is offered to explore the financial costs of designing and building greenhouses to grow oil palm. Students begin to understand the limitations of designs by using mathematical and computational thinking to solve problems.
- According to teacher resources, by the end of Unit 5, Ecosystem Dynamics and Biodiversity, students should be able to answer the question, “How does changing an ecosystem affect what lives there?” Teachers are offered additional lessons at the end of this unit to extend student thinking. In the suggested extensions, students are asked to diagram the flow of energy within trophic levels and describe how the available energy decreases in successive trophic levels in energy pyramids.

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

- Materials include questions for the teacher as a means of supporting students when they struggle to maintain engagement on a self-engaged demanding task. For example, in the grades 6–8 lesson daily overview, teachers are provided with suggested prompts and possible student answers to re-engage students when struggling with a task without lowering the cognitive demand of the task. Lessons include a variety of student activities that are assigned based on the achievement of the student's mastery of the SEPs and content knowledge.
- For example, each lesson includes a “Learning Plan” in the teacher's edition. Learning Plans are comprehensive, including example questions to ask at particular points in the lesson and example student responses. Materials include recommendations for collaborative exploration and/or scientific experimentation rooted in SEPs. The program is sequenced to enable units to build on what students have developed in prior units while supporting the development of CCCs and SEPs coherently across the program.

Kiddom OpenSciEd Grade 7

Indicator 7.2

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Materials include opportunities for students to engage in phenomena-based learning activities that include models, graphic organizers, and consensus discussions. For example, the lessons in the units provide opportunities for student-led investigation and modeling. Students also create and answer discussions related to the course level.
- Materials include educational game-based learning opportunities. For example, students engage with an interactive digestive system in Unit 7.3, Lesson 2. In Unit 7.3, Lesson 8, students run the NetLogo interactive simulation of flat versus tall villi in the small intestine.
- The materials include an investigation question that drives learning for the unit and lesson. An explanation of how teachers can use the driving question within sense-making discussions is included. The Teacher Handbook provides a detailed list of strategies for supporting equitable participation during discussions. The handbook also provides teachers with ways to use Scientists Circles to support an equitable science classroom. For example, all units present multiple opportunities for student-led investigations, questioning, and discussions related to the student's course level.

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

- Materials consistently support a variety of instructional groupings. Lessons on core content and concepts are provided to the whole group, while suggestions are provided for small group or one-on-one practice and activities. The materials provide guidance to teachers on when to use specific grouping structures based on the needs of students. Materials suggest when students are exploring new content, group students so that the teacher ensures a variety of voices within each small group.
    - For example, in Unit 1, Lesson 1, students are guided to work individually to make observations of the bath bomb investigation, work with a small group to carry out the investigation and explain the purpose of the initial models from the investigation, and work as a whole group to create the Driving Question Board (DBQ).
    - For example, in Lesson 1 of Unit 4, students reflect on a question posed by their teacher and record their reflections in their notebooks (independently). Then, they talk with their "elbow partner" in the Scientist Circle about related questions that the teacher poses.

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

- The Teacher Handbook provides information on the importance of providing multiple opportunities for students to learn from each other in science classrooms.
- Materials consistently support student engagement in collaborative learning structures, such as think-pair-share, while learning new concepts. For example, the Teacher Handbook states that "materials rely on students collectively figuring out science ideas together through productive discourse and classroom talk."
- In grade 7, lessons provide opportunities for students to work in collaborative groups and whole-group guided learning to answer the unit question through investigation and preset norms. For example, in Unit 7.1, students make observations of the bath bomb before adding it to water and after. Students record the noticings and wonderings, then share them on a piece of poster paper.
- A DQB is used at the beginning of each unit to capture what individual students are wondering about anchoring phenomena. The DQB is then revisited throughout the unit to document the progress students are making and to launch deeper investigations and problem-solving. Independent opportunities for students to examine recent scientific case studies and complete a reflection, argument, summary, or justification assignment support multiple types of student learning.

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

- Materials represent diverse communities using images and information that are respectful and inclusive. For example, in Unit 7.6, Lesson 16, materials use real-world examples and connections to represent a diversity of communities and places, including rural, urban, and suburban communities, cities, and states across the U.S. and countries around the world. Depictions of places are respectful and inclusive, with an emphasis on community strengths, resources, and unique characteristics.

- Teachers are provided with a standard set of norms in the first units of each grade level. For example, “We recognize and value that people think, share, and represent their ideas in different ways.” In Unit 6, Lesson 16, students are provided with four different community profiles and how each community is reducing CO_2 emissions. Students use the data collected from profiles to create a plan for their own communities.
- Materials represent a diversity of communities in the images and information about people and places. For example, in Unit 7.3, there are several images and names used in the student materials of lessons that represent diverse learners and cultures in the materials. In Lesson 7.5, Lesson 1, there are several images in the student assignment of diverse learners and cultures.

Kiddom OpenSciEd Grade 7

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

Evidence includes but is not limited to:

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

- Materials include linguistic accommodations commensurate with various levels of English language proficiency as defined by the ELPS.
    - For example, materials include teacher guidance for communication with English Language Learners (ELL) students, with the goal of creating comprehensible input for various levels of English language proficiency. Materials accommodate emergent bilingual (EB) students through visuals, realia, gestures, sentence stems, graphic organizers, anchor charts, and manipulatives. Materials lack specific scaffolding for each language proficiency level (Beginning, Intermediate, Advanced, and Advanced High).
    - For example, the teacher handbook includes two primary ways to support ELLs. First, through the curricular design and pedagogical routines, and second, by the educative boxes embedded in the teacher materials.
- Materials encourage strategic use of students' first language as a means to linguistic, affective, cognitive, and academic development in English. In Unit 9, Lesson 19, students create PSAs that define a problem, educate others about how the problem is affecting orangutans, and encourage others to take action to be part of the solution. It is suggested that teachers highlight the benefits of multilingual communication in the global world and encourage emerging multilingual students to develop a communication project that includes key messaging about the orangutan and palm oil problem in multiple languages.
- In the Course Unit Storylines and Teacher Guides, information is included as a resource for teachers and as a guide in using the instructional model to accommodate multilingual learners.

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The following is a direct quote from the text, “OpenSciEd Instructional Model: The instructional routines that make up the OpenSciEd Instructional Model provide many scaffolded opportunities for multilingual students to practice talking in partners, small groups, and then finally as a whole class. Activities include options for students to express their ideas in many ways, with an emphasis on students using both linguistic (e.g., talking and writing) and non-linguistic (e.g., drawing, graphing) resources to share their thinking.”

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.
    - Materials include tips for teachers about the importance of allowing students to express their understanding in their first language. For example, the Teacher Handbook states, “ Teachers should encourage students to express their ideas in language and discourse styles that they are comfortable with in order to open the conversation and sensemaking to all students.”
    - For example, materials include teacher guidance for communication with emerging multilingual learners (EMLs) with the goal of creating comprehensible input. According to the Teacher Handbook, lessons include educative boxes focused on EMLs, often appearing as supplemental text on the margins of lesson plans. In Lesson 7.1, there is a box called supporting emerging multilingual learners that gives guidance to teachers on how to support their EML learners.
    - For example, in Unit 7.6, Lesson 16, Day 1, Attending to Equity: Supporting Emerging Multilingual Students, students are instructed to work in small groups during the discussion so as to assist in sensemaking. Teachers point out cognates by placing them on word walls alongside new vocabulary terms.

Kiddom OpenSciEd Grade 7

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.
    - For example, materials suggest that teachers assign lessons to promote a home/school connection. At the beginning of Unit 1, Chemical Reactions and Matter, teachers print a unit “Storyline.” Teachers are encouraged to tell students to share the storylines and explain phenomena and/or how they solved a problem; however, materials lack resources for ongoing interactive feedback or progress sharing between school and home.
    - For example, the Unit Storyline provides the Lesson Question, Phenomena or Design Problem, what the students do and figure out, and how they represent it. It also discusses how students will engage with each of the phenomena presented in the unit.
    - For example, the teacher handbook provides information about the use of the science storyline approach, what it entails, and the process of the routines. The course storylines provide a brief overview of each unit in the course. Materials suggest for teachers to assign lessons to promote a home/school connection. Teachers are encouraged to tell students to share the storylines and explain phenomena and/or how they solved a problem.

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

- Materials provide information to be shared with caregivers for how they can help student learning. The Home Learning section of a unit has the student talk to family and/or community about the lesson.
    - For example, in Unit 4, Lesson 12, students investigate flameless heaters as they focus on chemical reactions and energy. Students are asked to survey family and friends using a link to an electronic survey provided by the teacher.
- The teacher handbook provides a safety acknowledgment to send home with students to share with parents and/or caregivers. The acknowledgment encourages students to go through the safety practices with their parents/caregivers to help create a safe learning environment in science class. The following is a direct quote from the handbook, “Prior to the first science investigation of the year, a safety acknowledgment form for students and parents or guardians should be provided and signed.”
- Home communication letters found at the end of the unit overview are provided for teachers as a resource to share with caregivers how they can help student learning. The following is a direct quote from the resource, “Helping your child make sense of their learning: There is no pre-teaching vocabulary because words often have multiple meanings, and are often easier to remember once students have some experience with it; therefore, ask your child to recall evidence or experiences to help elaborate on what their ideas and explanations are. Encourage your child to connect how their models or drawings help explain their ideas about the one-way mirror phenomenon. Ask your child how different structures or parts interact with other structures within their models. Ask your child what question(s) they are working on currently, and how the class has made progress so far. If your child sees the phenomenon or a similar phenomenon outside of school, encourage your child to record it and share it with the class, or explain to you what they think is happening.”
- For example, the Unit 7.1 Overview Materials contains a home communication letter at the end in both English and Spanish.

Materials include information to guide teacher communications with caregivers.

- Materials provide adequate information to guide teacher communications with caregivers. For example, Unit 7.1 provides a Unit Storyline that lets the student and caregiver know what question is to be taught in the Storyline about the question they are trying to figure out or a problem they are trying to solve.
- To promote a home/school connection, these materials can be assigned to students to share with their families. Teachers encourage students to share the storylines explaining the phenomenon and/or how they solved a problem with their caregivers. For example, in Unit 6, on Earth's Resources and Human Impact, a storyline is provided before the unit begins.
- Found in the seventh-grade science course Unit storylines and Teacher Guides is a video resource provided for teachers that guides them through communicating with parents and caregivers.

Kiddom OpenSciEd Grade 7

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.	PM
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

Partial Meets| Score 1/2

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

Materials are somewhat 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.

- The handbook explains that the sequence of activities is designed to make sense to students using “Storylines,” which provide a brief overview of each unit and a logical sequence of lessons.
- The materials do not include a cohesive scope and sequence that shows how science knowledge and skills are addressed over the course of the entire year.
- There is a progressive order of lessons for teachers to follow as outlined in the TEKS correlation document for the seventh grade that displays the TEKS and the location of the TEKS within each unit.
- There is an ELPS correlation document for the seventh grade that displays each ELPS and the location of the ELPS within each unit.

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

- The handbook explains that the sequence of activities is designed to make sense to students using “storylines.”
- Seventh Grade Materials Prompts and checklists are provided in student materials to support them in applying and reflecting on crosscutting concepts (CCCs). CCCs are highlighted in the sidebar column.
- In the “Putting Pieces Together” section, teachers review previous units and preview upcoming concepts at the start of each new unit.

- The *Teacher Handbook* suggests that when teachers introduce an "Anchoring Phenomenon," teachers encourage students to identify related phenomena from their personal experience or prior knowledge.

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

- Connections to previous content/units are included throughout units to draw on students' understanding of the material that was previously covered in order to support mastery and retention. For example, in 7.3.05, Connections to Previous Instruction, it says, "Think back to our Bath Bombs Unit:
    - How did we describe what is happening to the substances in chemical reactions?
    - What kinds of changes do you think are happening in your mouth when you eat the cracker?
    - Be ready to share these ideas with the whole class." This section is in Unit 3 and references students' understanding of content from Unit 1.
- 7.4.11 draws connections to the previous Unit 3, "Discuss the following questions:
    - How is what the plant is doing similar to what our bodies do, as we saw with M'Kenna?
    - When do the cells in our bodies do cellular respiration?
    - What do the cells in our bodies use to do cellular respiration?
    - Where is the seed sprout getting its food from to use as fuel?"
- In the "Putting Pieces Together" section of the units, teachers review previous units and preview upcoming concepts at the start of each new unit.
- The *Teacher Handbook* suggests that when teachers introduce an "Anchoring Phenomenon," teachers encourage students to identify related phenomena from their personal experience or prior knowledge.
- Anchoring phenomenon exposes to the teacher what students do and do not know about these mechanisms.

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Indicator 8.2

Materials include classroom implementation support for teachers and administrators.

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

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

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

Evidence includes but is not limited to:

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

- The *Teacher Handbook* gives instructions for developing and using science and engineering practices (SEPs), crosscutting concepts (CCCs), and anchoring phenomena.
- The *Teacher Handbook* provides overviews of features of the OpenSciEd units. It includes assessment guides, lesson implementation guides, and progress monitoring guides.
- Teachers are provided with editable lesson resources, including lab instructions, keys and rubrics, and example questions to ask at particular points in the lesson and example student responses.
- At the beginning of each lesson, teachers begin with “What Students Will Do,” then continue into the Lesson Learning Plan Snapshot, which reviews the summary and materials needed per student, per group, and per class.
- In Materials Preparation, teachers are provided with embedded technology, research-based instructional strategies, and scaffolds to enhance student learning.

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

- The *Teacher Handbook* gives instructions for developing and using science and engineering practices, crosscutting concepts, and anchoring phenomena. On the presentation slides that teachers use for planning, charts are included that outline alignment to Science and Engineering Practices (SEPs) and Crosscutting Concepts (CCCs) Alignment.
- The Teacher Background Knowledge in Unit 7.5 includes a flowchart that shows what cross-content standards are taught and where they build on other units.
- The TEKS alignment document pairs TEKS 7.11 on the effects of human activity on watersheds with Unit 6, which explores "How changes in Earth's systems impact our communities and what we can do about it."

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

- At the beginning of each lesson within a unit, there is a Lesson 1 Learning Plan Snapshot. The Snapshot contains a pacing guide for the lesson and what materials are needed for every activity. This guide includes videos, diagrams, charts, equipment, and supplies for every part of the lesson.
- Each lesson provides teachers with a materials list that indicates the items needed for each part of the lesson. This list also indicates whether materials should be provided per student, per group, or per class.
- The materials lists include links to vendors of needed items for each grade unit.

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

- In the *Teacher Handbook* in Section O, there is a section about Lab Safety for Science Investigations. It indicates that teachers should follow these lab safety recommendations for any lesson with an investigation. There is a list of seven safety recommendations.
- The Teacher Guide for each lesson guides teachers on how to deal with safety practices for the grade-appropriate use of equipment during the investigation.
- For example, at the beginning of Unit 9, there is a document titled "Teacher Background Knowledge," in which teachers are encouraged to adopt and practice appropriate safety practices during science investigations. A list of safety recommendations is also provided on this page.

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Indicator 8.3

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

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

Meets | Score 2/2

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

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

Evidence includes but is not limited to:

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

- Each unit begins with a Learning Plan Snapshot for each lesson. It includes prior knowledge, present objectives, and what the next lesson will entail.
- There is a timeline in the Lesson Plan Snapshot that details how many parts are in the lesson, the duration, a summary of each activity, any slides location, and materials needed.
- The Unit Storyline maps out each lesson within the unit and how many days and minutes it will take to complete the 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.

- In Unit Storylines, teachers are guided through each lesson with a sequence of activities designed as a journey to exploring phenomena that defy easy explanation.
- All phenomena are carefully selected to anchor the Unit Storyline and develop targeted disciplinary core ideas, crosscutting concepts, and science and engineering practices.
- Every lesson has a question to investigate using anchoring phenomena, crosscutting concepts, and science and engineering practices. For example, in Unit 7.1, Chemical Reactions, the Unit Storyline begins with the unit question, “How can we make something new that was not there before?”

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

- Each class/lesson is outlined in the Lesson Learning Plan Snapshot and is approximately 45–50 minutes long. The number of classes needed to complete all seventh-grade units is 187 class days.
- In the Teacher Background Knowledge document, teachers can view ways to adjust units for time constraints if needed. Teachers can also access options to shorten or condense parts of the unit without eliminating important sensemaking for students. On the presentation slides teachers use for planning, notes for “How do I shorten or condense the unit if needed? How can I extend the unit if needed?" are included.
- The Middle School Scope and Sequence document explains how each unit builds on what students have developed in prior units and how crosscutting concepts (CCCs) and science and engineering practices (SEPs) build coherently across the program.

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Indicator 9.1

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

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

Not Scored

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

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

Evidence includes but is not limited to:

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

- Materials are designed with clear, designated places for important information for teachers.
    - For example, in Unit 7.2, Lesson 1, Teacher guides are designed in a way that teachers can locate important information easily for planning and implementation.
    - For example, each unit has a storyline. A storyline is a lesson-by-lesson summary of the unit with the lesson question, phenomena, or design problem, what students do and figure out, and how to navigate to the following lesson.
- Materials include an appropriate amount of white space and a design that supports and does not distract from student learning.
    - For example, in Unit 7.1, Lesson 1, Day 4 has a turn-and-talk activity worksheet that uses a limited amount of fonts.
    - For example, in Unit 7.1, Lesson 12, Day 2, students perform an assessment activity with a partner and a group. The margins, edges, and empty spaces around the content are consistent throughout the worksheet.
- Student materials are appropriately designed to support student learning. Examples include a clear main subject, topic, or purpose; prominent and clear titles and headings; and subheadings that clearly mark sections.

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

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

    - For example, in Unit 6.4, students investigate how Mt. Everest is shrinking. They read an article about the mountain. The article includes photographs of the mountain and the expedition team, as well as a map of the area where the mountain can be found.
    - For example, in Unit 7, Lesson 1, students are asked to develop an initial model to explain patterns observed in the sky. A graphic organizer with prompts is provided to guide student thinking.
    - For example, the pictures and graphics in Unit 7.1, Lesson 4, Day 2, clearly show the contents of two different mixes in order to analyze patterns between the substances and the results of the investigation.
    - For example, in Unit 7.1, Lesson 12, presentation materials include magnified images of different bath bombs that clearly show students the unique gas bubbles of each sample. Students are building an understanding of the gas from bath bombs.
    - For example, the digital materials embed age-appropriate videos for all students to have a deeper understanding of lessons. These videos have links for teachers to enhance language with subtitles and the ability to pause for clarification.
- Materials provide images in lessons that are authentic photos as well as clearly labeled diagrams to enhance student and teacher guidance. For example, in Unit 7.5, the picture of an orangutan is a real example that enhances students' visualization for those who have never seen one or for the ELL students to make a connection.

Materials include digital components that are free of technical errors.

- Materials include digital components that are consistently free of technical errors.
    - For example, the Unit 7.1 Lesson Assessment materials are free of spelling, grammar, and punctuation errors.
    - For Example, in Unit 7.3, teacher resources are free of inaccurate answer keys on worksheets and assessments.
    - For example, Unit 4, Lesson 1, includes a handout for students to complete in class. The handout is free of spelling, grammar, and punctuation errors.
    - For example, the Unit 1 storyline is free of inaccurate content materials or information.

Kiddom OpenSciEd Grade 7

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 learning through teacher guidance for using investigations, videos, interactives, and related activities to support student learning.
    - For example, in Unit 7.8, there is a virtual simulation of the Earth. Students draw a Notice and Wonder chart about the Ancient Earth Globe.
    - For example, in Unit 7.3, Lesson 8, students complete an interactive simulation to explain the relationship between greater villi height and increased absorption.
- Materials provide guidance for integrating embedded technology within materials as well as tools outside of the materials.
    - For example, grades 6–8 have the option of using a digital notebook if the teacher chooses.
    - For example, in Lesson 7.4.1, students answer questions in their notebook about where maple syrup comes from while viewing a video.

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 provide digital tools for students to engage with recurring themes and concepts.

    - For example, in Unit 7.1, students start with investigating and analyzing data about matter behavior. Then, they analyze and develop models for the description. Finally, they construct an explanation to describe possible products in a chemical reaction from a set of known reactants by considering that the type of atoms in the chemical reactions should not change.
    - For example, in Unit 7, Lesson 1, students observe three video clips of hail falling in different areas of the United States on different days. They develop a model to try to explain what causes this to occur.
- Materials integrate digital technology in ways that support student engagement with science and engineering practices and grade-level content.
    - For example, in Unit 7.2, Lesson 2, students begin a hand warmer investigation. While watching the video clip during the investigation, students collect observations about the substances inside the hand warmer as they are warming up.
    - For example, in Unit 7.1, students start with investigating and analyzing data about matter behavior. Then, they analyze and develop models for the description. Finally, they construct an explanation to describe possible products in a chemical reaction from a set of known reactants by considering that the type of atoms in the chemical reactions should not change.
- Materials provide opportunities for students to obtain, evaluate, and communicate information using digital tools.
    - For example, in Unit 7.2, Lesson 2, students begin a hand warmer investigation. While watching the video clip during the investigation, students collect observations about the substances inside the hand warmer as they are warming up.
    - For example, in Unit 7.1, Lesson 6, Day 1, students watch a video and compare and contrast what happens when different combinations of substances are combined. Students construct explanations and record them on the class DQB.
    - For example, in Unit 7.8, Lesson 8, students analyze the differences observed and discuss the causes and effects of plate movement using online simulations. Students analyze the differences observed and discuss the causes and effects of plate movement using online simulations.

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

- Materials integrate digital technology that supports teacher-to-student collaboration.
    - For example, in Unit 9, Lesson 1, the teacher shows students a video that provides a brief background on where orangutans live, what they eat, and natural predators. Teachers then pose the question, “How could whether we buy candy have any impact on orangutan populations in the wild?”
    - For example, teachers can create a digital whiteboard as their DQB. Teachers can use the slide deck as a resource to create images to use with the Digital Whiteboard. Also, teachers can share this presentation with students as an editable slide deck so they can collaborate with each other.
- Materials integrate digital technology that supports student-to-student collaboration.
    - For example, in Unit 7.4.01, students compare initial models of how plants get food molecules with their elbow partners.

- For example, in Unit 7.3, Lesson 1, students share models with a partner and then do a gallery walk to compare models.
- For example, in Unit 7.6, Lesson 3, students turn and talk with their partner for two minutes about the following question from the investigation from Day 1, answering "Compare the average temperature and humidity level change in the unheated bottles with the average temperature and humidity level change in the heated bottles. What patterns do you notice?"

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

- According to the Middle School Program Overview, materials are available free on their website. They can be viewed or downloaded as PDF files or Google Docs to view or copy. The videos, interactive models, and other assets needed for each unit are also available on the website.
- Digital materials are accessible and compatible with multiple operating systems and devices. According to the Design Specifications, instructional materials assume that every classroom has a dedicated computer that can project on a screen or display that is large enough for the entire class to see and has an internet connection that is fast enough to support video streaming. The instructional materials may call for interactive use of computers by students in a ratio of two students per computer, as long as those activities can also be done as a whole class on the dedicated classroom computer.
- Digital materials are accessible and compatible with multiple operating systems and devices and learning management systems. For example, the materials are accessible and compatible with Chromebooks, PCs, iPads, Apple computers, and smartphones.
  - For example, the materials state, "[The publisher] offers science curriculum by OpenSciEd, curricula that promotes learning through discovery on a dynamic digital platform."
  - For example, the Remote Learning Online Tool Organizer is a list of online tools that focuses on how to use the storyline instructionally when teaching remotely.

Kiddom OpenSciEd Grade 7

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 and grade-level appropriate and sometimes provide support for learning. 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.

- Grades 68 materials provide information that identifies how digital technology and online components are aligned with the grade-level scope and approach to science knowledge and skills progressions. Materials include a digital teacher guide with live hyperlinks to the other online resources to facilitate planning and make it easy to use.
    - For example, in Unit 7.1, there is a teacher's guide that begins every lesson and explains how to plan out the lesson and how student knowledge and skills will progress throughout the lesson.
- The digital technology and online components are developmentally appropriate for the grade level.
    - For example, in Unit 7.1, there are explanations for the video clips and other digital materials in the teacher's guide for each lesson.
    - For example, in Unit 6, Lesson 17, students create a checklist for what a resilience plan for their school and local community should include. Teachers are given an extension opportunity in which students view a video intended to focus students on solutions that will rebalance carbon or make their communities resilient.
    - For example, in Unit 7, Lesson 7, students watch a video showing the total solar eclipse in 2017 and viewers observing it. Students record their noticings and wonderings.

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

- Materials provide specific teacher guidance for embedding the technology within lessons and assessments.
    - For example, grades 6–8 unit storylines and lesson plan snapshots provide recommendations for teachers on which days to use technology with students and if there is a time during lessons when the technology would enhance or support student learning. Materials outline recommendations in the unit, week, and daily lesson overview pages.
    - For example, in Unit 7, Lesson 1, as students learn about Earth in space, teachers are directed to show a video about Manhattanhenge. Students record what they notice and any wonderings they have after watching the video. Materials tell teachers to make sure to either pause at the beginning and read or, out loud from here, the text presented on the paper: “Twice a year, the sun sets in exact alignment with the city grid of Manhattan. The calculated architecture of the city and the celestial body of the sun form a visualization and a connection between fabrication and nature. The urban phenomenon here is called Manhattanhenge.”
    - For example, Unit 7.2 provides a teacher's guide for each lesson that references available technologies that enhance the lesson. The links are included in the guide for the teachers.

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

- Within the Course Unit Storylines and Teacher Guides activities, an activity can be assigned by teachers to share with parents and caregivers the technology that will be utilized throughout the course. The information includes a link to a video library for access to videos in each unit of the course. Parents can view a library of the simulations that will be used in each unit as well.
- The following is a direct quote of text included in the caregiver technology information page, “Students will interact with multiple forms of media throughout the course. Simulations and data visualization tools will enable students to create and refine models of their ideas of key scientific phenomena. Embedded engineering practices in units focused on problem-solving and technology emphasize that there is not always one right answer. When having conversations about science, you can encourage your child’s curiosity through talking about their own noticings and wonderings from the technology that they utilize in class. When supporting your students’ use of technology, hold off on providing answers right away for your child; we want students to make progress on their own questions and to think of ways to make sense of what’s around them.”
- Materials provide a Unit Storyline for parents and caregivers on how to support students.
    - For example, in Unit 7.2, there is a Unit Storyline that indicates what the overall Unit question, the lesson question, phenomena or design problem, what students will do and figure out, and how they will represent it.
    - For example, Unit 5 begins with a lesson-by-lesson summary of the unit with the lesson question, phenomena or design problem, what students do and figure out, and how they navigate to the following lesson. Teachers may choose to send this home with students at the beginning of a unit to share with parents.