Publisher Name	Program Name
Kiddom	*Texas Math: Geometry Powered by Kiddom*
Subject	**Course**
Mathematics	Geometry

Texas Essential Knowledge and Skills (TEKS) Coverage: **100%**

English Language Proficiency Standards (ELPS) Coverage: **100%**

Quality Review Overall Score: **220 / 227**

Quality Review Summary

Rubric Section	Quality Rating
1. Intentional Instructional Design	**53 / 53**
2. Progress Monitoring	**25 / 28**
3. Supports for All Learners	**30 / 32**
4. Depth and Coherence of Key Concepts	**23 / 23**
5. Balance of Conceptual and Procedural Understanding	**64 / 66**
6. Productive Struggle	**25 / 25**

Strengths

- 1.1 Course-Level Design: Materials include a scope and sequence outlining the TEKS, ELPS, concepts, and knowledge taught in the course, with suggested pacing guides for various instructional calendars, explanations for the rationale of unit order and concept connections, guidance for unit and lesson internalization, and resources to support administrators and instructional coaches in implementing the materials as designed.
- 1.2 Unit-Level Design: Materials include comprehensive unit overviews that provide background content knowledge and academic vocabulary necessary for effective teaching and contain supports for families in both Spanish and English with suggestions for supporting their student's progress.
- 1.3 Lesson-Level Design: Materials include comprehensive, structured lesson plans with daily objectives, questions, tasks, materials, or instructional assessments required to meet the content and language standards. They provide a lesson overview outlining the suggested timing for each component, a list of necessary teacher and student materials, and guidance on the effective use of lesson materials for

extended practice, such as homework, extension, and enrichment.

- 2.2 Data Analysis and Progress Monitoring: Materials include instructional assessments and scoring information that provide guidance for interpreting and responding to student performance, offer guidance on using tasks and activities to address student performance trends, and include tools for students to track their own progress and growth.
- 3.1 Differentiation and Scaffolds: Materials include teacher guidance for differentiated instruction, activities, and scaffolded lessons for students who have not yet reached proficiency, pre-teaching or embedded supports for unfamiliar vocabulary and references in text, and guidance for differentiated instruction, enrichment, and extension activities for students who have demonstrated proficiency in grade-level content and skills.
- 3.2 Instructional Methods: Materials include prompts and guidance to support teachers in modeling, explaining, and directly and explicitly communicating concepts to be learned. They provide teacher guidance and recommendations for effective lesson delivery using various instructional approaches, and support multiple types of practice with guidance on recommended structures, such as whole group, small group, and individual settings, to ensure effective implementation.
- 4.1 Depth of Key Concepts: Materials provide practice opportunities and instructional assessments that require students to demonstrate depth of understanding aligned to the TEKS, with questions and tasks that progressively increase in rigor and complexity, leading to grade-level proficiency in mathematics standards.
- 4.2 Coherence of Key Concepts: Materials demonstrate coherence across courses and grade bands through a logically sequenced scope and sequence, explicitly connecting patterns, big ideas, and relationships between mathematical concepts, linking content and language across grade levels, and connecting students' prior knowledge to new mathematical knowledge and skills.
- 4.3 Spaced and Interleaved Practice: Materials provide spaced retrieval and interleaved practice opportunities with previously learned skills and concepts across lessons and units.
- 5.1 Development of Conceptual Understanding: Materials include questions and tasks that require students to interpret, analyze, and evaluate various models for mathematical concepts, create models to represent mathematical situations, and apply conceptual understanding to new problem situations and contexts.
- 5.2 Development of Fluency: Materials provide tasks designed to build student automaticity and fluency for grade-level tasks, offer opportunities to practice efficient and accurate mathematical procedures, evaluate procedures for efficiency and accuracy, and include embedded supports for teachers to guide

students toward more efficient approaches.

- 5.4 Development of Academic Mathematical Language: Materials provide opportunities for students to develop academic mathematical language using visuals, manipulatives, and language strategies, with embedded teacher guidance on scaffolding vocabulary, syntax, and discourse, and supporting mathematical conversations to refine and use math language.
- 5.5 Process Standards Connections: Materials integrate process standards appropriately, nor do they provide descriptions of how they are incorporated and connected throughout the course, within each unit, or in each lesson.
- 6.1 Student Self-Efficacy: Materials provide opportunities for students to think mathematically, persevere through problem-solving, and make sense of mathematics, while supporting them in understanding multiple ways to solve problems and requiring them to engage with math through doing, writing, and discussion.
- 6.2 Facilitating Productive Struggle: Materials support teachers in guiding students to share and reflect on their problem-solving approaches, offering prompts and guidance for providing explanatory feedback based on student responses and anticipated misconceptions.

Challenges

- 2.1 Instructional Assessments: Materials do not include teacher guidance to ensure accurate administration of instructional assessments. Diagnostic and summative assessments are not aligned to the TEKS of the course.
- 3.3 Support for Emergent Bilingual Students: Materials include general guidance for teachers supporting emergent bilingual students but do not address the various levels of language proficiency as defined by the ELPS. The materials do not explicitly reference the ELPS or include information related to state-approved bilingual/ESL programs.
- 5.3 Balance of Conceptual Understanding and Procedural Fluency: Materials do not explicitly state how the conceptual and procedural emphasis of the TEKS are addressed.

Summary

Texas Math powered by Kiddom is 9–12 mathematics Program. The curriculum provides a comprehensive scope and sequence that outline the Texas Essential Knowledge and Skills (TEKS) and English Language Proficiency Standards (ELPS) taught throughout the course, a problem-based curriculum that includes activities that promote student efficacy and sense-making, and a strong coherence throughout the materials by connecting language and concepts across lesson, units, topics, and across grade bands. Additionally, the program includes extension activities, a variety of instructional

assessments, guidance for unit and lesson internalization, and support for instructional coaches and administrators to support teachers in implementing the curriculum.

Campus and district instructional leaders should consider the following:

- The materials align with the Common Core State Standards, which are referenced throughout. A separate document provides alignment to the Texas Essential Knowledge and Skills.
- The materials emphasize students' development of fluency, conceptual understanding, and academic mathematical language through support provided to teachers in implementing differentiation and scaffolding of lessons and activities.

Intentional Instructional Design

1.1	Course-Level Design	15/15
1.1a	Materials include a scope and sequence outlining the TEKS, ELPS, concepts, and knowledge taught in the course.	**5/5**
1.1b	Materials include suggested pacing (pacing guide/calendar) to support effective implementation for various instructional calendars (e.g., varying numbers of instructional days – 165, 180, 210).	**2/2**
1.1c	Materials include an explanation for the rationale of unit order as well as how concepts to be learned connect throughout the course.	**2/2**
1.1d	Materials include guidance, protocols, and/or templates for unit and lesson internalization.	**2/2**
1.1e	Materials include resources and guidance to support administrators and instructional coaches with implementing the materials as designed.	**4/4**

Materials include a scope and sequence outlining the TEKS, ELPS, concepts, and knowledge taught in the course. Materials provide suggested pacing guide/calendar to support effective implementation for various instructional calendars (e.g., 165, 180, 210 instructional days). Materials include an explanation for the rationale of unit order as well as how concepts to be learned connect throughout the course. Materials include guidance, protocols, and/or templates for unit and lesson internalization. Materials include resources and guidance to support administrators and instructional coaches with implementing the materials as designed.

Evidence includes, but is not limited to:

Materials include a scope-and-sequence outlining the TEKS, ELPS, concepts, and knowledge taught in the course.

- The materials include a "Scope and Sequence" subsection located in the "Course Guide" tab of the "Course Overview" section. Additionally, in the "IMRA Rubric Submission Tool Math 9–12, there is a document called, "Copy of Scope and Sequence Texas" that outlines the TEKS and ELPs taught in the course.
- The materials include a narrative in the Course Guide that identifies specific knowledge taught throughout the course. For example, the narrative states, "For the first several units, students practice generating conjectures and observations. This begins with work on compass and straightedge constructions. They gradually build up to formal proof, engaging in a cycle of conjecture, rough draft, peer feedback, and final draft narratives."
- The scope and sequence outlines concepts taught in the course and includes a "Pacing Guide" flowchart of the prerequisite knowledge needed within and between Algebra I, Geometry, and Algebra II.
- The "Course Narrative" explicitly describes the knowledge taught in each unit. The narrative starts with a brief overview of the course and its structure, followed by an example of a student reference chart, and concludes with a unit-by-unit walkthrough of the Geometry course.

Materials include suggested pacing (pacing guide/calendar) to support effective implementation for various instructional calendars (e.g., varying numbers of instructional days–165, 180, and 210).

- The materials include a suggested pacing calendar found in the supplementary Texas Scope and Sequence. The pacing calendar is designed for 126 days of initial instruction and provides teachers with an optional additional 24 days for extension, review, assess, and reteach days. With the addition of these days, the suggested pacing is 150 days. The scope and sequences also outline that each lesson is allotted 60 minutes.
- The instructional materials also include an Adaptation Guide that provides suggestions for lessons to add or lessons to remove or modify. This guide also includes a modified plan for each unit as well as a category list for lessons ranked by priority — high priority, medium priority, and low priority.

Materials include an explanation for the rationale of unit order as well as how concepts to be learned connect throughout the course.

- Materials include an explanation of the rationale for the unit order, located following the "Dependency Diagram" within the Scope and Sequence subsection of the Course Guide tab. The rationale states that "revising the order would have a negative effect on mathematical or pedagogical coherence." Some dependencies are needed to address the standards. For example, there is an arrow from G.3 (TEKS involving Similarity) to G.4 (TEKS involving trigonometric ratios for acute angles) because students learn that by similarity, "...side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles."
- Materials include an explanation, preceded by the Dependency Diagram, of how concepts to be learned connect throughout the course by unit. The Dependency Diagram illustrates how units are structured and connected within the course. Arrows between units indicate course direction, inter-unit dependencies, and connections to other mathematics courses. The "About These Materials" section includes a comparison table of three secondary mathematics courses (Algebra I, Geometry, and Algebra II) that describes each unit. Each description provides links to additional materials for researching the connectivity of the units and the required progression.

Materials include guidance, protocols, and/or templates for unit and lesson internalization.

- In the Course Guide, the "Instructional Routines" page includes guidance for lesson internalization by establishing protocols throughout the course, including "What...Where...Why" explanations and directing the teacher to "prepare for and conduct whole-class discussions." Materials also include a "How to Use These Materials" section that frames lesson development by providing guidance and protocols for lesson internalization. Units reference a portion of the overall guidance and expected implementation using activities aligned directly to learning objectives.

- The materials provide guidance and recommendations for lesson implementation through lesson breakdowns and demonstrating the expected instructional delivery.
- Materials include templates for internalization. For example, the Unit 2 "Congruence - Section Level Planning" materials provide a template for unit and lesson internalization. This template includes a breakdown of the lesson, "I can" statements for student understanding, lesson delivery strategies, assessment suggestions, deep-dive recommendations, and guidance for using instructional materials such as texts, embedded technology, enrichment activities, and instructional strategies.

Materials include resources and guidance to support administrators and instructional coaches with implementing the materials as designed.

- On the Support page of the Kiddom website, there are 19 articles available for administrators and instructional coaches that provide information and resources to help navigate Kiddom for their school or district. Categories for resources and guidance include Teaching With Kiddom, Features, Customizing Kiddom, Grading & Reporting, Kiddom Integrations, Students and Families, and Troubleshooting. For example, the article titled "What are Admin Assignment View Reports?" provides administrators with guidance on the student achievement report. Specifically, Assignment View reports "equip school and district leaders, like you, with tools and data to make better instructional decisions and resource allocation decisions."
- Materials include resources to support administrators and instructional coaches with implementing the materials as designed. The "Teacher Guide," located in the Course Overview, provides resources for administrators and instructional coaches to support the implementation of the materials. The "Typical IM Lesson" subsection explains the four phases of a typical lesson: warm-up, instructional activities, lesson synthesis, and cool-down. The How to Use These Materials subsection further breaks down the three phases of a typical activity: launch, student work time, and activity synthesis.
- The materials include resources to support administrators and instructional coaches, such as video training. The materials state, "As part of Kiddom's NEW Admin Insights Reporting Package, we now offer Usage Reports! These reports allow district and school leaders to gain insight into Kiddom activation and usage across schools. This video link provides materials that include resources and guidance to support administrators and instructional coaches in implementing the materials as designed."

Intentional Instructional Design

1.2	Unit-Level Design	4/4
1.2a	Materials include comprehensive unit overviews that provide the background content knowledge and academic vocabulary necessary to effectively teach the concepts in the unit.	**2/2**
1.2b	Materials contain supports for families in both Spanish and English for each unit with suggestions on supporting the progress of their student.	**2/2**

The materials include comprehensive unit overviews that provide the background content knowledge and academic vocabulary necessary to effectively teach the concepts in the unit. Materials contain supports for families in both Spanish and English for each unit with suggestions on supporting the progress of their student.

Evidence includes, but is not limited to:

Materials include comprehensive unit overviews that provide the background content knowledge and academic vocabulary necessary to effectively teach the concepts in the unit.

- The materials include unit narratives at the beginning of each unit in the "Lesson Overview" section. These narratives contain background content knowledge necessary to effectively teach the concepts covered in the unit. They provide background information, prior learning expectations, concepts, academic vocabulary, and teaching strategies. For example, the Unit 4 narrative states, "Prior to beginning this unit, students will have considerable familiarity with right triangles. They learned to identify right triangles in grade 4. In grade 8, students studied the Pythagorean Theorem and used similar right triangles to develop the concept of slope. This unit builds upon this extensive experience and grounds trigonometric ratios in familiar contexts." Each unit also includes an "Adaptation Guide" section outlining a plan for the unit and incorporating prior student knowledge to enhance engagement with the materials.
- The materials provide access to a set of academic terms within the resources. At the beginning of the course and throughout the units, the materials contain Glossary Terms. This includes a slide deck providing "a complete grade-level list including word, definition, and picture for all vocabulary words introduced in the IM Math curriculum." However, academic vocabulary is not clearly provided in the unit overviews. Academic vocabulary directly connected with each lesson or activity is not evident. Academic vocabulary is only offered for the entire resource. The glossary terms provided are insufficient to teach each unit's concepts effectively.

Materials contain supports for families in both Spanish and English for each unit with suggestions on supporting the progress of their student.

- Each unit overview includes family support materials in English and Spanish. These materials can be accessed online or in PDF form and include lesson videos. The materials provide a

description of problem-based curriculum, support for learners, and ideas to encourage learners to be successful.

- The materials contain resources to support families with information to assist their students in learning in English and in Spanish. Family Support Materials in each unit provide an overview of student learning objectives and suggestions for ways caregivers can support the unit learning at home. Additionally, caregivers can access their student's progress.

Intentional Instructional Design

1.3	Lesson-Level Design	34/34
1.3a	Materials include comprehensive, structured, detailed lesson plans that include daily objectives, questions, tasks, materials, and instructional assessments required to meet the content and language standards of the lesson.	**30/30**
1.3b	Materials include a lesson overview outlining the suggested timing for each lesson component.	**1/1**
1.3c	Materials include a lesson overview listing the teacher and student materials necessary to effectively deliver the lesson.	**2/2**
1.3d	Materials include guidance on the effective use of lesson materials for extended practice (e.g., homework, extension, enrichment).	**1/1**

Materials include comprehensive, structured, detailed lesson plans that include daily objectives, questions, tasks, materials, and instructional assessments required to meet the content and language standards of the lesson. Materials include a lesson overview outlining the suggested timing for each lesson component. Materials include a lesson overview listing the teacher and student materials necessary to effectively deliver the lesson. Materials include guidance on the effective use of lesson materials for extended practice (e.g., homework, extension, enrichment).

Evidence includes, but is not limited to:

Materials include comprehensive, structured, detailed lesson plans that include daily objectives, questions, tasks, materials, and instructional assessments required to meet the content and language standards of the lesson.

- The materials include comprehensive lesson plans that encompass daily objectives, questions, tasks, materials, and instructional assessments necessary to meet the content and language standards of the lesson. Lessons feature a lesson target expressed as an "I can..." student statement (for example, "I can calculate scale factors for lengths, surface areas, and volumes if I'm given any 1 of the 3 factors"). Within each lesson plan subsection, teachers find required materials for tasks, activities, or discussions, along with questions designed to guide and assess student understanding ("What was the easiest or most difficult part about this activity?" "How did you determine the scale factor for lengths in the first problem?" "How did you find the volume of the dilated cylinder on the second card? Did you use the volume formula or another method?"). Lesson plans include subsections with tasks and activities that provide explicit instructions for teacher facilitation. Each lesson concludes with a "Cool-down" section and a "Cumulative Practice Set" as instructional assessments.
- Materials include detailed lesson plans that contain learning goals, required materials, multiple student tasks, questions, and formative assessments aligned with content and language standards. For example, Unit 2, Lesson 12 provides three learning goals: (1) Comprehend a conjecture and express it as a specific statement to prove; (2) Critique others' reasoning about quadrilaterals; (3) Prove theorems about quadrilaterals. Required materials include one-inch strips cut from cardstock with evenly spaced holes and metal paper

fasteners. The lesson's activities include student tasks such as writing geometric proofs and exchanging proofs with a partner to provide and receive feedback. The lesson concludes with students completing a formative assessment that prompts them to explain how Elena can use the fact that all rectangles are parallelograms in her proof.

- Lesson plans include comprehensive lists of materials, a structured approach for teaching the lesson, instructional routines, activities, and formative assessment questions. They feature a bulleted list outlining the phases of the lesson, each with specified time frames, guiding questions, and required materials. Additionally, lesson plans detail objectives, questions, tasks, and materials aimed at developing procedural skill fluency and application. They include subsections with tasks and activities, providing explicit instructions for teacher facilitation. Each lesson concludes with a Cool-down and Cumulative Practice Set serving as instructional assessments.

Materials include a lesson overview outlining the suggested timing for each lesson component.

- The materials include a "Course Overview" outlining the suggested timing for each lesson component. The "Teacher Guide," located in the Course Overview, suggests timing for three of its four lesson components: (1) Warm-up (5–10 minutes), (2) Lesson Synthesis (5–10 minutes), and (3) Cool-down (approximately 5 minutes). Within each unit, the materials include lesson-specific guidance for the fourth component, (4) Student Activities, with the Teacher Guide stating that "Each lesson plan is designed to fit within a class period that is at least 45 minutes long."
- Lessons include suggested timing for lesson components. For example, in Unit 3, Lesson 6, the materials suggest 5 minutes for the warm-up, 15 minutes for each of the two lesson activities, and 5 minutes for the cool-down. The Teacher Guide suggests 5–10 minutes for the lesson synthesis component.

Materials include a lesson overview listing the teacher and student materials necessary to effectively deliver the lesson.

- Materials identify the teacher materials necessary to deliver the lessons within each unit. The lesson overview also includes teacher materials to support lesson preparation: "Dynamic geometry software can be used in the Transforming by Coordinates activity, the cool-down, and the lesson synthesis. If this is not available, provide access to geometry toolkits for tracing paper and straight edges."
- Within each unit, lesson plans include teacher materials needed for effective implementation.
- Materials identify the student materials necessary to deliver the lessons within each unit. For example, in Unit 6, Lesson 1, students are instructed to use scientific calculators. In Unit 7, Lesson 11, students are required to use scissors and string during the lesson. As teachers prepare for the lesson, they should "be prepared to display an applet for all to see during the lesson synthesis." Unit 3, Lesson 11 lists required student materials in the lesson overview as "four-function calculators and rulers."

Materials include guidance on the effective use of lesson materials for extended practice (e.g., homework, extension, enrichment).

- The Teacher Guide includes guidance on effectively using lesson materials for extended practice in the "How to Use These Materials" subsection. The lessons indicate that extension problems are available to all students under the "Are You Ready for More?" heading. The How to Use These Materials section states, "These problems delve deeper into grade-level mathematics and often establish connections between the current topic and other concepts…They are intended for students to opt in if they finish the main class activity early or wish to engage in additional mathematics independently."
- The How to Use These Materials subsection includes guidance for using the "Practice Problems" sets, reminding instructors that "it is up to teachers to decide which problems to assign, including assigning none at all."
- The "Information for Families" section of the Course Overview includes guidance on the effective use of the "Family Support Materials." These materials provide extra learning opportunities for families, including tasks for students to complete with their families outside of the classroom. Additionally, there is a solutions section to track student progress across the unit.

Progress Monitoring

2.1	Instructional Assessments	21/24
2.1a	Materials include a variety of instructional assessments at the unit and lesson level (including diagnostic, formative, and summative) that vary in types of tasks and questions.	**12/12**
2.1b	Materials include the definition and intended purpose for the types of instructional assessments included.	**2/2**
2.1c	Materials include teacher guidance to ensure consistent and accurate administration of instructional assessments.	**1/2**
2.1d	Diagnostic, formative, and summative assessments are aligned to the TEKS and objectives of the course, unit, or lesson.	**4/6**
2.1e	Instructional assessments include standards-aligned items at varying levels of complexity.	**2/2**

Materials include a variety of instructional assessments at the unit and lesson level (including diagnostic, formative, and summative) that vary in types of tasks and questions. Materials include the definition and intended purpose for the types of instructional assessments included. Materials include teacher guidance to ensure consistent of instructional assessments. Materials do not include teacher guidance to ensure accurate administration of instructional assessments. Diagnostic, formative, and summative assessments are aligned to the objectives of the unit or lesson. Formative assessments are aligned to the TEKS of the course. Diagnostic and summative assessments are not aligned to the TEKS of the course. Instructional assessments include standards-aligned items at two levels of complexity.

Evidence includes, but is not limited to:

Materials include a variety of instructional assessments at the unit and lesson level (including diagnostic, formative, and summative) that vary in types of tasks and questions.

- Materials include various instructional assessments at the unit level, including diagnostic, formative, and summative assessments, with varying tasks and questions. The "Teacher Guide" in the "Course Overview" indicates that each unit begins with a "Check Your Readiness" diagnostic assessment that includes various tasks and questions. For example, in Unit 3's Check Your Readiness, students encounter open-ended questions, items that require a written response, and a task in which they must dilate a triangle by a given scale factor, providing a sketch to show their work.
- Materials include formative assessments at the unit level, including mid-unit assessments in longer units that use various task and question types. For example, the Unit 1 mid-unit assessment includes multiple-choice and multi-select items, questions requiring a written response, and a task requiring a straightedge and compass to construct a perpendicular bisector.
- Materials include summative assessments at the end of each unit that contain various tasks and question types. For example, the end-of-unit assessment in Unit 7 includes multiple-

choice and multi-select items, open-ended response questions, and a task that requires students to construct a circumscribed circle for a given triangle. However, materials do not include summative assessments at the lesson level.

- Materials include an "Anticipation Guide" within each unit identifying which unit-level diagnostic items align with individual lessons. Materials also include "Cool-down" lesson-level formative assessments after each lesson.
- Materials include a variety of instructional diagnostic and formative assessments at the lesson level that vary in types of tasks. Lessons include a warm-up that assesses prior knowledge needed to accomplish lesson learning objectives, acting as a lesson diagnostic. Lessons also include various formative assessment opportunities, located in the "Activity Synthesis" section of the lesson. Lesson materials include a Cool-down lesson summative assessment.

Materials include the definition and intended purpose for the types of instructional assessments included.

- The Teacher Guide includes definitions of the types of instructional assessments included.
- Materials include the intended purpose for the types of instructional assessments included. Each unit includes a diagnostic "Check Your Readiness" section to assess concepts and skills prerequisites to the unit. Each lesson closes with a Cool-down section as a "formative assessment to provide feedback or to plan further instruction." Each unit closes with an end-of-unit summative assessment "intended to gauge students' understanding of the key concepts of the unit."
- Materials include a "Summative Assessments" subsection in the "Assessment" section of the Teacher Guide. The Summative Assessment outlines the intended purpose and use of unit summative assessments in gauging "students' understanding of the key concepts of the unit while also preparing students for new-generation standardized exams."
- Materials include an "Assessment Guide" detailing the intended implementation of assessments. Teacher guidance materials explain each unit's Check Your Readiness section as "a pre-unit diagnostic assessment" and detail how "to pace or tune instruction... address below-grade skills" and "adapt tasks or practice problems" based on student work.
- While materials provide direct structure for multiple assessment types, materials lack teacher guidance for lesson diagnostic and lesson formative assessments.

Materials include teacher guidance to ensure consistent and accurate administration of instructional assessments.

- Materials include teacher guidance to ensure accurate administration of assessments as needed within the "Assessment Suggestions" section of each unit's section-level planning guide. For example, in Unit 4, the materials suggest the following for the unit's Check Your Readiness pre-assessment: "Administer all 6 items within the first day or two of this section. Use the guidance provided with each problem to adjust instruction so that students can access the math in the unit."

- Materials provide teacher and student instructions for each unit's pre- and end-of-unit assessment in the unit's Teacher Guide. For example, the Teacher Guide in Unit 7 provides teacher guidance regarding students using "reference charts, and they may find a scientific calculator helpful...Make tracing paper, compasses, and straightedges available to students"; further, students are instructed to "use a scientific calculator, construction tools, and your reference chart." Teacher instructions for the Unit 7 end-of-unit assessment" state, "Students will need a scientific calculator, their reference charts, and construction tools (compass and straightedge or tracing paper for paper folding)." The student instructions state, "You may use a scientific calculator, construction tools, and your reference chart."
- Materials lack clear guidance on how to consistently administer assessments. Materials do not give teachers guidance on timing or conditions for the various instructional assessments to ensure fairness and equal opportunity for all students.

Diagnostic, formative, and summative assessments are aligned to the TEKS and objectives of the course, unit, or lesson.

- Materials include diagnostic pre-unit assessments that are aligned with each unit's objectives. Each pre-assessment item includes teacher notes for evaluating responses that identify which lesson it supports within the unit. For example, the first question on the Unit 1 "Check Your Readiness" pre-assessment includes teacher notes for evaluating responses that identify the properties of rotations that are assessed, stating that "Understanding these properties is a prerequisite for success in Lesson 1."
- Materials include formative assessments aligned to the TEKS and lesson objectives in a supplemental Google Sheet. For example, Unit 4, Lesson 6 includes four formative assessment items aligned to G.9A that require students to determine the lengths of sides in a right triangle by applying sine, cosine, and tangent trigonometric ratios to solve problems.
- Summative assessments are aligned to the objectives of the unit or lesson.
- Diagnostic and summative assessments are not aligned to the TEKS of the course. Materials include a "Notes for Evaluating Responses" document containing the unit or lesson's objectives.
- The Section Level Planning Guide includes a table that indicates the objective and related assessment suggestions for each lesson. The publisher provides a separate Formative Assessments — TX TEKS document that shows the alignment of the TEKS.

Instructional assessments include standards-aligned items at varying levels of complexity.

- Instructional assessments include standards-aligned items at varying levels of complexity. Items include questions showing evidence of differing levels of complexity but lack any explicit organization or hierarchy of variance regarding each assessment item's level of complexity.

Progress Monitoring

2.2	Data Analysis and Progress Monitoring	4/4
2.2a	Instructional assessments and scoring information provide guidance for interpreting and responding to student performance.	**2/2**
2.2b	Materials provide guidance for the use of included tasks and activities to respond to student trends in performance on assessments.	**1/1**
2.2c	Materials include tools for students to track their own progress and growth.	**1/1**

The instructional assessments include standards-aligned items at varying levels of complexity. Materials provide guidance for the use of included tasks and activities to respond to student trends in performance on assessments. Materials include tools for students to track their own progress and growth.

Evidence includes, but is not limited to:

Instructional assessments and scoring information provide guidance for interpreting and responding to student performance.

- Instructional assessments and scoring information provide guidance for interpreting and responding to student performance. The "Teacher Guide," in the "Course Overview," provides guidance for interpreting and responding to student performance that can be applied to any curriculum assessment. For example, when a student's performance on a cool-down formative assessment suggests that the student does not understand a key concept, the materials suggest choosing one or more of the following strategies: look ahead at upcoming lessons to identify a time to re-engage with the same topic, display samples of anonymous student work for the class to analyze together, provide students with written feedback and ask them to revise and resubmit, or select practice problems similar to the cool-down to assign over the next few lessons.
- Materials include guidance for interpreting student performance on assessments by providing "Notes for Evaluating Responses" for each item assessed in unit pre- and post-assessments. For example, for the first item in Unit 2's "Check Your Readiness" pre-assessment, the "Notes for Evaluating Responses" explain common student misconceptions associated with the incorrect answer choices, stating, "Students may choose A or C if they assume (Point) C is the center of rotation. Students may choose G if they don't understand the corresponding parts."
- The materials provide guidance for interpreting students' incorrect responses. For example, the Unit 7 end-of-unit assessment states, "Students might choose B if they believe angles AOB and ACB are complementary. Students might choose C if they believe central and inscribed angles are congruent. Students might choose D if they reverse the roles of central and inscribed angles."

Materials provide guidance for the use of included tasks and activities to respond to student trends in performance on assessments.

- Materials contain guidance for using the included activities to respond to trends in student performance on assessments. For example, after teachers administer the Unit 6 Check Your Readiness assessment in the Unit 6 "Adaptation Guide," the materials recommend teachers "move quickly through the first 3 lessons if students do well in pre-unit diagnostic question 7." Later, in Unit 6, Lesson 11, the materials recommend, "If students struggle on Question 2 from the pre-unit diagnostic assessment, plan to spend more time on the slope during the warm-up." The Unit 8 Adaptation Guide suggests teachers skip Lesson 1 "if the pre-unit diagnostic assessment shows your students have these skills."
- Materials include a Kiddom Support website with a section called "What Insights Do The Assignment View Reports Provide?" that provides information on accessing student performance reports and that can sort student response data by question or standard. Materials lack explicit instruction for interpreting and responding to student response data.

Materials include tools for students to track their own progress and growth.

- Materials provide tools for students to track their own progress and growth. For example, the "Reports" feature, located in the "Kiddom Support" section of the website, allows students to track their own progress and performance by standards and assignments. Student reports include a student's performance, class average, grades, and feedback from the teacher in either chart form or as a downloadable report.
- The materials include data visualization tools for students to track progress and complete and achieve goals. "By aligning curriculum to instruction, Kiddom offers live visibility into both student performance and instructional data. We provide real-time data in a format that's useful to every stakeholder, ensuring that intervention happens on multiple levels, and a web of support is created around students."
- Materials include a student-facing learning dashboard and reports for students to track growth and progress. Report materials are color-coded: "Dark blue is the highest possible. Light blue means you've mastered it. Orange means you're approaching mastery. Red means that you need help with that standard or goal."

Supports for All Learners

3.1	Differentiation and Scaffolds	8/8
3.1a	Materials include teacher guidance for differentiated instruction, activities, and/or paired (scaffolded) lessons for students who have not yet reached proficiency on grade-level content and skills.	**3/3**
3.1b	Materials include pre-teaching or embedded supports for unfamiliar vocabulary and references in text (e.g., figurative language, idioms, academic language). (T/S)	**2/2**
3.1c	Materials include teacher guidance for differentiated instruction, enrichment, and extension activities for students who have demonstrated proficiency in grade-level content and skills.	**3/3**

Materials include teacher guidance for differentiated instruction, activities, and/or paired (scaffolded) lessons for students who have not yet reached proficiency on grade-level content and skills. Materials include pre-teaching or embedded supports for unfamiliar vocabulary and references in text (e.g., figurative language, idioms, academic language). Materials include teacher guidance for differentiated instruction and extension activities for students who have demonstrated proficiency in grade-level content and skills. Materials include teacher guidance for enrichment activities for students who have demonstrated proficiency in grade-level content and skills.

Evidence includes, but is not limited to:

Materials include teacher guidance for differentiated instruction, activities, and/or paired (scaffolded) lessons for students who have not yet reached proficiency on grade-level content and skills.

- At the beginning of each unit, the "Unit-at-a-Glance" documents provide teacher guidance for differentiating instruction for students who have not yet mastered grade-level content and skills in response to each lesson's cool-down. For example, in Unit 3 Lesson 5, the materials recommend, "If students struggle with setting up the correct ratios in the cool-down, plan to focus on this when opportunities arise over the next several lessons. For example, in the activity Nested Triangles of Lesson 7, select student work that uses color coding or tracing paper to pull apart images to identify the correct values to use.
- Materials include "Advance Students' Thinking" prompts throughout the course, which provide teacher guidance for differentiated instruction to help students who have not yet reached grade-level proficiency build below-course-level prior knowledge. For example, Activity 4.3, located in Unit 5, Lesson 4, states that "if students give an answer of 120 square units for the answer to the last part, ask them what happened when the rectangle in the previous activity was scaled by a factor of 3. Did the area also increase by a factor of 3?" As a second example, the "Adaptation Pack," located in the Unit 3 "Modified Plan" chart, includes teacher guidance for students who have not yet reached proficiency on grade-level content and skills: "Optional lesson: Give students an additional opportunity to practice finding unknown values in proportional relationships using contextual examples. If students struggle with CYR Question

2, plan to do this lesson with a focus on calculating side lengths using the Pythagorean Theorem."

Materials include pre-teaching or embedded supports for unfamiliar vocabulary and references in text (e.g., figurative language, idioms, academic language). (T/S)

- The materials include embedded supports when introducing new academic vocabulary. For example, in Unit 2, Lesson 8, the materials guide teachers in leading a class discussion about the term "converse" during "Lesson Synthesis." Teachers display two statements and ask students to compare and contrast each statement, then explain that such statements are called converses, and then provide a second set of statements for students to discuss using the following statements: "(1) If you practice, then you'll get better, and (2) If you don't practice, then you won't get better." The class should arrive at the conclusion that they are not converses—though one is the negation of the other, they don't switch the order of what is given and what is concluded.
- The materials include regular practice in developing academic vocabulary and giving students structured opportunities to add to their vocabulary reference charts using academic language. For example, Unit 9, Lesson 9.4 Lesson Synthesis states, "Ask students to add these definitions to their reference charts as you add them to the class reference chart: ...arccosine..., ...arcsine..." As a second example, in Unit 3, Lesson 1, "Activity Synthesis," the teacher guides students to recall the definition of scale factor from middle school: "Ask students to add this definition to their reference charts as you add it to the class reference chart: Scale factor is the factor by which every length in an original figure is multiplied when you make a scaled copy."
- Materials include a "Notice and Wonder" routine, which embeds support when introducing unfamiliar references in text by providing students a structure to pose questions ("Wonder") to a peer or to the teacher. Students unfamiliar with a specific context or reference may "wonder" to a trusted source with the intent of receiving the knowledge they need.

Materials include teacher guidance for differentiated instruction, enrichment, and extension activities for students who have demonstrated proficiency in grade-level content and skills.

- Materials contain teacher guidance for extension activities, available to all students with the heading "Are You Ready for More?" for students who have demonstrated proficiency in grade-level content and skills, where "problems go deeper into grade-level mathematics and often make connections between the topic at hand and other concepts." According to the "How to use these Materials" section of the "Teacher Guide," "They (extension activities) are intended to be used on an opt-in basis by students if they finish the main class activity early or want to do more mathematics on their own." For example, in Unit 1, Lesson 7, students construct a square inscribed in a circle. The "Are You Ready for More?" extension activity asks students to "use a straightedge and compass moves to construct a square that fits perfectly outside the circle, so that the circle is inscribed in the square. How do the areas of these 2 squares compare?"

- The materials provide guidance for extension activities. For example, Unit 1 "Adaptation Guide" includes guidance on how extension lessons benefit students by extending mathematical learning into upper-level math courses: "This unit does not require any lessons to be removed. However, Lessons 10–13 are all about radian measure not needed to be successful in the rest of this course. So, if time is an issue, these lessons can be pushed into Algebra 2 Unit 6. In general, radian measure is less important for mainstream students, however, those students preparing for calculus will be at a disadvantage if they have not studied radian measure before pursuing calculus."
- There are enrichment and extension activities and optional lessons in materials. The Section Level Planning Guide provides an overview of student learning objectives, multiple suggestions for activities, and a chart that outlines the levels of learning. The levels are identified as Explore, Play, and Discuss, Deep Dive, Synthesize and Apply, and Ongoing Practice. There are lessons and activities aligned to each level.
- Materials do not include teacher guidance for differentiated instruction for students who have demonstrated proficiency in grade-level content and skills.

Supports for All Learners

3.2	Instructional Methods	13/13
3.2a	Materials include prompts and guidance to support the teacher in modeling, explaining, and communicating the concept(s) to be learned explicitly (directly).	**6/6**
3.2b	Materials include teacher guidance and recommendations for effective lesson delivery and facilitation using a variety of instructional approaches.	**4/4**
3.2c	Materials support multiple types of practice (e.g., guided, independent, collaborative) and include guidance for teachers and recommended structures (e.g., whole group, small group, individual) to support effective implementation.	**3/3**

Materials include prompts and guidance to support the teacher in modeling, explaining, and communicating the concept(s) to be learned explicitly (directly). Materials include teacher guidance and recommendations for effective lesson delivery and facilitation using a variety of instructional approaches. Materials support multiple types of practice (e.g., guided, independent, collaborative) and include guidance for teachers and recommended structures (e.g., whole group, small group, individual) to support effective implementation.

Evidence includes, but is not limited to:

Materials include prompts and guidance to support the teacher in modeling, explaining, and communicating the concept(s) to be learned explicitly (directly).

- Materials include prompts for modeling, explaining, and communicating concepts to be learned using designated mathematical modeling prompts throughout the course. For example, in Unit 3, Lesson 1, students design a playground that can hold three times as many students as one. Students can choose to find a scale factor that will increase the area by a factor of three, increase only one dimension by a factor of three, or design a differently shaped playground with a fixed area and determine a shape that will ensure the perimeter remains under budget. The materials provide the teacher with questions to ask as students work on the task, a rubric for analysis, and sample student responses.
- In the "Course Overview," the "Teacher's Guide" includes the "Mathematical Modeling Prompts" section, which guides teachers in modeling, explaining, and communicating concepts. The "How to Prepare and Conduct the Modeling Lesson or Project" subsection provides teachers with prompts to consider as they prepare lesson instruction and modeling, directing teachers to "Have data ready to share if you plan to give it when students ask…If desired, instruct students to use a template for organizing modeling work…Decide to what extent students are expected to iterate and refine their model."
- In the Mathematical Modeling Prompts section, the "Ways to Support Students While They Work on a Modeling Prompt" subsection guides the teacher in the explanation of concepts, including teacher prompts for explaining concepts to students as they process information, such as "Coach them on ways to organize their work better…Remind them of analog and digital tools that are available to them…When students get stuck or neglect an important

aspect of the work, ask them a question to help them engage more fully in part of the modeling cycle..."
- Materials include prompts to support the teacher in communicating the concepts to be learned explicitly (directly) in the "How to Interpret the Provided Analysis of a Modeling Prompt" subsection, which guides teachers in various methods for communicating results to students, including a chart with weighted expectations.

Materials include teacher guidance and recommendations for effective lesson delivery and facilitation using a variety of instructional approaches.

- Materials include teacher guidance and recommendations for effective lesson delivery using a variety of instructional approaches. According to the "Typical IM Lesson" section of the Teacher's Guide, lessons contain specific warm-up routines that frequently include "Number Talks," "Notice and Wonder," and "Which One Doesn't Belong." This section of the Teacher Guide also includes recommendations for implementation: "Once students and teachers become used to the routine, warm-ups should take 5–10 minutes. If warm-ups frequently take much longer than that, the teacher should work on concrete moves to more efficiently accomplish the goal of the warm-up." Materials also recommend establishing a hand signal for students to display, indicating they have an answer to share.
- For example, Unit 6, Lesson 8, Activity 8.3 includes a "Card Sort" routine with teacher-facing instructions to deliver and facilitate the activity. The general guidance for teachers is in the "Activity Synthesis" section of the lesson: "Select groups to share how they sorted their cards." Attend to the language that students use to describe the graphs and equations, giving them opportunities to describe the parabolas more precisely. Highlight the use of terms like focus, directrix, and distance," with more specific guidance provided in the "Activity Narrative" section: "A sorting activity gives students opportunities to analyze representations, statements, and structures closely and make connections (MP2, MP7). As students work, encourage them to refine their descriptions of the parabolas using more precise language and mathematical terms (MP6)," and the "Launch" section: "As students work on this activity, listen for and collect the language students use to justify why they matched a graph of a parabola with an equation. Write the students' words and phrases on a visual display. As students review the visual display, create bridges between current student language and new terminology. For example, the word 'point' must be specified with the term 'focus,' 'vertex,' or 'point on the parabola (x,y).' This will help students use the mathematical language necessary to precisely describe the relationship between the focus, vertex, and the equation of the parabola."
- Materials include teacher guidance in the "Ways to Support Students While They Work on a Modeling Prompt" document, which recommends questions to support the teacher in facilitating lesson delivery. Example questions include: "What quantities are important? Which ones change and which ones stay the same?" "What information do you know? What information would it be nice to know? How could you get that information? What reasonable assumption could you make?" "What pictures, diagrams, graphs, or equations might help

people understand the relationships between the quantities?" "How are you describing the situation mathematically? Where does your solution come from?" "Under what conditions does your model work? When might it not work?" "How could you make your model better? How could you make your model more useful under more conditions?"

Materials support multiple types of practice (e.g., guided, independent, collaborative) and include guidance for teachers and recommended structures (e.g., whole group, small group, individual) to support effective implementation.

- Materials support multiple types of practice (e.g., guided, independent, collaborative) and include guidance for teachers and recommended structures (e.g., whole group, small group, individual) to support effective implementation. For example, lessons in Unit 2 include multiple types of practice with teacher guidance and recommended structures. In Lesson 1, the materials guide the teacher to "Display the image for all to see. Ask students to think of at least one thing they notice and at least one thing they wonder. Give students 1 minute of quiet think time, and then 1 minute to discuss the things they notice with their partner, followed by a whole-class discussion." In Lesson 3, students work in pairs to sort a set of cards containing various transformations. In Lesson 7, the materials provide teacher guidance for student work structures, stating, "Give students 3 minutes of work time, then pause the activity. Select two students' drawings with the auxiliary line to display for all to see—one with each diagonal. Use the Notice and Wonder instructional routine to elicit what students notice in their peers' diagrams."
- Materials for teachers include instructions with multiple structures. For example, in Unit 5, Lesson 18, Activity 18.2, the Launch section directs teachers to "arrange students in groups of 3–4" for part of the lesson (small group) and "pause for a whole-class discussion" (whole group). The activity then concludes with practice problems in the "Student Facing Task Statement" section, which may be completed individually, in teacher-assigned groups, or as a whole group.
- Materials support multiple types of structure and practice. For example, in Unit 1, Lesson 22, Launch, materials recommend the following progression: students begin with one minute of think time (individual), followed by discussion with a partner (small group), and conclude with a whole group discussion.
- Materials support multiple types of practice and include guidance for teachers and recommended structures to support effective implementation. For example, in Unit 7, Lesson 7, Activity 7.2, in the "Thinking Inside the Box" lesson, students start out using graphing technology. Should students not have this available or struggle, an applet is available for whole-group instruction. Once graphs and tables have been generated, the teacher is provided with questions to guide student inquiry. The lesson then concludes with a student-facing task to extend and apply their thinking.

Supports for All Learners

3.3	Supports for Emergent Bilingual Students	9/11
3.3a	Materials include teacher guidance on providing linguistic accommodations for various levels of language proficiency [as defined by the English Language Proficiency Standards (ELPS)], which are designed to engage students in using increasingly more academic language.	**1/2**
3.3b	Materials include implementation guidance to support teachers in effectively using the materials in state-approved bilingual/ESL programs.	**0/1**
3.3c	Materials include embedded guidance for teachers to support emergent bilingual students in developing academic vocabulary, increasing comprehension, building background knowledge, and making cross-linguistic connections through oral and written discourse.	**8/8**
3.3d	If designed for dual language immersion (DLI) programs, materials include resources that outline opportunities to address metalinguistic transfer from English to the partner language.	**Not scored**

Materials include teacher guidance on providing linguistic accommodations for at least 1 level of language proficiency [as defined by the English Language Proficiency Standards (ELPS)], which are designed to engage students in using increasingly more academic language. Materials do not include implementation guidance to support teachers in effectively using the materials in state-approved bilingual/ESL programs. Materials include embedded guidance for teachers to support emergent bilingual students in developing academic vocabulary, increasing comprehension, building background knowledge, and making cross-linguistic connections through oral and written discourse.

Evidence includes, but is not limited to:

Materials include teacher guidance on providing linguistic accommodations for various levels of language proficiency [as defined by the English Language Proficiency Standards (ELPS)], which are designed to engage students in using increasingly more academic language.

- The materials include general guidance for teachers related to support for EBs and do not address the multiple levels of language proficiency as defined by the English Language Proficiency Standards (ELPS). For example, Unit 7, Lesson 1 includes sentence stems, such as "...and...are alike because..." "...and...are different because..." "One thing that is the same is..." "One thing that is different is...," in a dedicated section of the "Teacher Guide" that are intended for use with all EB students regardless of their varying levels of language development or proficiency.

Materials include implementation guidance to support teachers in effectively using the materials in state-approved bilingual/ESL programs.

- Materials include "Unit at a Glance" documents in each unit, which provide embedded guidance for teachers to support EB students in developing academic vocabulary and comprehension through both oral and written discourse in each lesson by providing learning goals that specify how students demonstrate mastery of each learning goal, either orally, in writing, or both, next to the lesson's "Cool-down" formative assessment. For example, the learning goal in Unit 6, Lesson 2 states, "Describe (using words and other representations) transformations as functions that take points in the plane as inputs and give other points as outputs." During the Cool-down, students transform a triangle on the coordinate plane using a given rule and then describe the transformation in words.
- In Unit 2, Lesson 5, Activity 5.2 guides teachers through the "Representing, Conversing" routine to build cross-linguistic connections while students develop academic vocabulary through written discourse by writing a mathematical proof demonstrating that "Figure $ABCD$ is congruent to figure $EFGH$" and then "creating a visual display of their proof." Students use their writing to make cross-linguistic connections by examining at least two other visual representations and "discuss[ing] what they noticed" with a partner. This is cross-linguistic because they take written and visual stimuli and communicate orally. Through the discussion, teachers help students build background knowledge by confirming "the language students use to convey the idea that a transformation exists to take a segment to a congruent segment." While the discussion is oral, students use written notes as the basis for comprehension of both the visual and oral components.
- In Unit 8, Lesson 7, Activity 7.2, the "Clarify, Critique, Correct" routine guides teachers to support students' oral linguistic development. Students start with writing to answer a prompt and continue to discuss. By writing first, students build their academic vocabulary orally when using the correct vocabulary with a partner, "identify[ing] and clarify[ing] that there are three possibilities of how the winning and losing doors can be arranged." Because students discuss their ideas, hear from other sources, compare information, and respond, students build oral comprehension skills. While some students may not know a game show prior to this lesson, students may gain clarification and build contextual background knowledge during discussion. Because students write, respond, and speak, they build cross-linguistic comprehension skills.
- In "Activity Synthesis," the "Mathematical Language" routine supports English language learners in "Writing, Speaking: MLR 1 Stronger and Clearer Each Time." During this activity, students make corrections and explain them to their partners.
- Materials embed guidance for the teacher to support EB students in developing their language skills through written and oral discourses. For example, the "Writing, Listening, Conversing: MLR1 Stronger and Clearer Each Time" document guides teachers to "Use this routine to help students improve their written responses for the last question. Give students time to meet with 2–3 partners to share and receive feedback on their responses. Display feedback prompts that will help students strengthen their ideas and clarify their language."

- The material supports English Language Proficiency standards at the lesson level. Mathematical Language Routines help students engage with increasingly sophisticated academic language throughout the course.

If designed for dual language immersion (DLI) programs, materials include resources that outline opportunities to address metalinguistic transfer from English to the partner language.

- The materials state in the "Supporting Diverse Learners" section of the "Teacher Guide" that "each lesson includes instructional strategies...that suggest mathematical language routines (MLRs) that provide students with access by supporting them with the language demands of a specific activity without reducing the mathematical demand of the task."
- All student-facing materials in Geometry have been translated from English into Spanish to support the dual language immersion program for Spanish speaking students.

Depth and Coherence of Key Concepts

4.1	Depth of Key Concepts	3/3
4.1a	Practice opportunities over the course of a lesson and/or unit (including instructional assessments) require students to demonstrate depth of understanding aligned to the TEKS.	**1/1**
4.1b	Questions and tasks progressively increase in rigor and complexity, leading to grade-level proficiency in the mathematics standards.	**2/2**

Practice opportunities over the course of a lesson and/or unit (including instructional assessments) require students to demonstrate depth of understanding aligned to the TEKS. Questions and tasks progressively increase in rigor and complexity, leading to grade-level proficiency in the mathematics standards.

Evidence includes, but is not limited to:

Practice opportunities over the course of a lesson and/or unit (including instructional assessments) require students to demonstrate depth of understanding aligned to the TEKS.

- Materials include practice opportunities over the course of the unit for students to demonstrate learning at the depth of understanding aligned to the TEKS. Each lesson in the online teacher and student materials consists of a warm-up, activities with a practice set, a cool-down, and a cumulative set of practice problems. Each of these provides students with practice opportunities where students explain and justify their reasoning to demonstrate their depth of understanding. For example, the activity narrative in Unit 4, Lesson 1 "Angles and Steepness" states, "The goal of this lesson is for students to recognize that the ratio of the legs of a right triangle with a given acute angle is fixed. They are building connections to similar right triangles in the previous unit. Students should leave the lesson wondering how the people who wrote the Americans with Disabilities Act guidelines knew what the ratio of two sides of a right triangle would be for a given angle, or what the angle would be for a given ratio." At the conclusion of each unit is a cumulative assessment that includes varying levels of questions, as well as both multiple choice, multiple response, short answer, and constructed response questions.
- Materials include activities through the online teacher and student resources that provide opportunities to work with real-world problems. For example, 1.4 Cool-Down – Sidewalk Ramp asks students to determine the horizontal distance of a sidewalk ramp with a four-inch vertical distance. This activity combines mathematics process TEKS with Geometry TEKS to give students the opportunity to further their understanding of the content.

Questions and tasks progressively increase in rigor and complexity, leading to grade-level proficiency in the mathematics standards.

- The materials provide tasks that progressively increase in rigor and complexity, as outlined in each unit's "Section Level Planning Guide." For example, in Unit 4, students first use cosine,

sine, and tangent (trig ratios) to find side lengths of right triangles, then apply trig ratios to find the height of an object, then use arccosine, arcsine, and arctangent to find angle measures in right triangles, and finally apply trigonometry to solve a variety of problem types.

- Questions progressively increase in rigor and complexity, leading to grade-level proficiency in the mathematics standards. For example, Unit 4 "End-of-Unit Assessment" provides a summative unit assessment using questions with increasing depth of knowledge. Question 1 (Q1) asks, "What is the area of triangle ABC?" at a depth of knowledge one (DOK1) question. Q3 transitions to DOK2 by asking, "In building a tent, Jada ties a rope from the top of a pole 3 meters high to a stake 4 meters away from the base of the pole. Jada draws this diagram to help find the angle made between the rope and the ground. Which equation can Jada use to find the value of x?" Q6 increases rigor to DOK3 in the following question: "Astronomers often measure large distances using astronomical units (AU) where 1 AU is the average distance from Earth to the Sun. In the image, d represents the distance from a star to the Sun. Using a technique called 'stellar parallax,' astronomers determined θ is 0.00001389 degrees... How far away is the star from the Sun in astronomical units?" Lastly, Q7 increases the rigor to DOK4.

Depth and Coherence of Key Concepts

4.2	Coherence of Key Concepts	12/12
4.2a	Materials demonstrate coherence across courses/grade bands through a logically sequenced and connected scope and sequence.	**2/2**
4.2b	Materials demonstrate coherence across units by explicitly connecting patterns, big ideas, and relationships between mathematical concepts.	**3/3**
4.2c	Materials demonstrate coherence across units by connecting the content and language learned in previous courses/grade levels and what will be learned in future courses/grade levels to the content to be learned in the current course/grade level.	**3/3**
4.2d	Materials demonstrate coherence at the lesson level by connecting students' prior knowledge of concepts and procedures from the current and prior grade level(s) to new mathematical knowledge and skills.	**4/4**

Materials demonstrate coherence across courses/grade bands through a logically sequenced and connected scope and sequence. Materials demonstrate coherence across units by explicitly connecting patterns, big ideas, and relationships between mathematical concepts. Materials demonstrate coherence across units by connecting the content and language learned in previous courses/grade levels and what will be learned in future courses/grade levels to the content to be learned in the current course/grade level. Materials demonstrate coherence at the lesson level by connecting students' prior knowledge of concepts and procedures from the current and prior grade level(s) to new mathematical knowledge and skills.

Evidence includes, but is not limited to:

Materials demonstrate coherence across courses/grade bands through a logically sequenced and connected scope and sequence.

- Materials demonstrate course coherence by providing a logically sequenced scope and sequence table outlining the course progressions for Algebra I, Geometry, and Algebra II.
- Materials in the "Course Guide" include "Narrative" sections that provide teachers explanations of the course's sequencing and its alignment with and coherence to curricula spanning multiple grade levels and content bands. For example, the Unit 5 Narrative subsection states, "In previous grades, students solved problems involving area, surface area, and volume for various solids." Continuing, the Narrative references grade 6 concepts: "Students worked with areas of triangles and quadrilaterals, as well as surface areas and volumes of right rectangular prisms including those with fractional edge lengths," grade 7 content: "Students found areas of circles, solved problems involving the volume and surface area of right prisms, and described plane sections of three-dimensional figures," and grade 8 content: "Students solved problems involving volumes of spheres, cones, and cylinders using given volume formulas." The materials reference previously learned content from earlier courses in the curriculum and how those materials are used and expanded upon in the current content band.

- As a further example, the Narrative section for the Unit 1 subsection begins by describing coherence, sequencing, and connections: "In grade 8, students determine the angle-preserving and length-preserving properties of rigid transformations experimentally, mostly with the help of a coordinate grid." "In previous courses, students developed their understanding of the concept of functions."
- The Narrative states that students will build with a vertical alignment or progression of mathematical concepts from middle school and high school math courses. "Students build on their middle school study of transformations of figures. Students use transformation-based definitions of congruence and similarity, allowing them to rigorously prove the triangle congruence and similarity theorems. They apply these theorems to prove results about quadrilaterals, isosceles triangles, and other figures. Students extend their understanding of similarity when they study right triangle trigonometry, which in future courses will be expanded into a study of periodic functions."

Materials demonstrate coherence across units by explicitly connecting patterns, big ideas, and relationships between mathematical concepts.

- Materials demonstrate coherence across units by explicitly connecting big ideas between mathematical concepts in the Narrative section. For example, the Unit 3 Narrative states, "In a previous unit, students used rigid transformations to justify the triangle congruence theorems of Euclidean geometry: Side-Side-Side Triangle Congruence Theorem, Side-Angle-Side Triangle Congruence Theorem, and Angle-Side-Angle Triangle Congruence Theorem. In this unit, students use dilations and rigid transformations to justify triangles are similar." The Unit 7 Narrative explains, "Earlier in this course, students made formal geometric constructions, studied similarity and proportional reasoning, and proved theorems about lines and angles. This unit builds on these skills and concepts to investigate the geometry of circles more closely." Another example from the Narrative specifically identifies relationships between segments and angles in circles, which are used to develop the concept of angles in circles and radian measures. Students are to end the year with probability, which connects back to prior learning in grade 7 about combined events: "Students analyze relationships between segments and angles in circles and develop the concept of radian measure for angles, which will be built upon in subsequent courses. They close the year by extending what they learned about probability in grade 7 to consider probabilities of combined events, including identifying when events are independent. Within the classroom activities, students have opportunities to engage in aspects of mathematical modeling."
- Materials demonstrate coherence across units by explicitly connecting patterns and relationships between mathematical concepts, as described in the Narrative section. For example, the Unit 5 Narrative gives teachers an overview of materials taught in Unit 5, 3D Solids Geometry, and includes how the unit connects to content previously taught in the course: "The unit...builds on students' prior knowledge about volumes of prisms to introduce Cavalieri's Principle," applying patterns noted in the Principle to determine if "solids have equal volumes." A further example in the Unit 3 Narrative demonstrates coherence across the unit using constructions: "This unit previews many of the important concepts that students

rely on to make sense of trigonometry in later units. The latter part of the unit focuses on similar right triangles. In addition, students are introduced to some of the applications of right triangles that they will explore in more depth in the trigonometry unit, such as finding the heights of objects through indirect measurement."

Materials demonstrate coherence across units by connecting the content and language learned in previous courses/grade levels and what will be learned in future courses/grade levels to the content to be learned in the current course/grade level.

- The Unit Narrative, located at the beginning of each unit, demonstrates coherence across units by connecting previously learned content from previous grade levels to the content to be learned in the current unit. For example, the Unit 4 Narrative states, "Prior to beginning this unit, students will have considerable familiarity with right triangles. They learned to identify right triangles in grade 4. Students studied the Pythagorean Theorem in grade 8 and used similar right triangles to build the idea of slope. This unit builds on this extensive experience and grounds trigonometric ratios in familiar contexts."
- Materials demonstrate coherence across units by connecting the language learned in previous grade levels to the content to be learned in the current course in each unit's "Adaptation Guide." For example, the Unit 1 Adaptation Guide identifies several terms that students engaged with in previous grade levels, including angle bisector, reflection, square, and translation. Similarly, the Unit 4 Adaptation Guide identifies language used in previous grade levels, including right triangles, Pythagorean Theorem, similar triangles, and slope.
- Materials demonstrate coherence by connecting to content from prior courses. For example, the Unit 5 Narrative states, "In previous grades, students solved problems involving area, surface area, and volume for various solids. In grade 6, students worked with areas of triangles and quadrilaterals, as well as surface areas and volumes of right rectangular prisms including those with fractional edge lengths. In grade 7, students found areas of circles, solved problems involving the volume and surface area of right prisms, and described plane sections of three-dimensional figures. In grade 8, students solved problems involving volumes of spheres, cones, and cylinders using given volume formulas"; this then connects to the current unit, where "...students practice spatial visualization in three dimensions, study the effect of dilation on area and volume, derive volume formulas using dissection arguments."
- Materials demonstrate coherence across units by connecting what will be learned in future course/grade levels to the content to be learned in the current course/grade level. For example, the Unit 7 Narrative includes an overview of radians and their measurement of angle and makes the connection to the Algebra 2 curricula: "Students develop fluency with radian measures...This is important for the transition to Algebra 2. In that course, students will explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle."

Materials demonstrate coherence at the lesson level by connecting students' prior knowledge of concepts and procedures from the current and prior grade level(s) to new mathematical knowledge and skills.

- Materials demonstrate lesson-level coherence by connecting prior knowledge of concepts from the current course to new concepts. For example, Unit 2, Lesson 2 Lesson Narrative states, "In this lesson, students continue to apply the concept of corresponding parts. In a previous lesson, students justified that two figures being congruent guarantees that all pairs of corresponding parts are congruent. In this lesson, students explore a different direction. If any pair of corresponding parts is not congruent, then the two figures cannot be congruent." As a further example, Unit 5, Lesson 9 Lesson Narrative Overview relates students' prior knowledge, stating, "In previous grades, students learned formulas for the volumes of cones, cylinders, and spheres. In this lesson, they recall how to calculate the volume of a cylinder, using informal arguments to compare the volume of a cylinder to the volume of a prism that has an equal height and area of its base."
- Materials demonstrate coherence at the lesson level by connecting students' prior knowledge of concepts and procedures from prior grade levels to new mathematical knowledge and skills. For example, in Unit 6, Lesson 1, Lesson Narrative, the materials note, "In grade 8, students applied the Pythagorean Theorem to find the distance between two points in a coordinate system. Here, students calculate side lengths and angle measures, proving triangles are congruent."

Depth and Coherence of Key Concepts

4.3	Spaced and Interleaved Practice	8/8
4.3a	Materials provide spaced retrieval opportunities with previously learned skills and concepts across lessons and units.	**4/4**
4.3b	Materials provide interleaved practice opportunities with previously learned skills and concepts across lessons and units.	**4/4**

Materials provide spaced retrieval opportunities with previously learned skills and concepts across lessons and units. Materials provide interleaved practice opportunities with previously learned skills and concepts across lessons and units.

Evidence includes, but is not limited to:

Materials provide spaced retrieval opportunities with previously learned skills and concepts across lessons and units.

- Materials provide spaced retrieval opportunities with previously learned skills and concepts across units by providing cumulative practice sets at regular intervals in each unit. For example, after learning about the characteristics of circles in Unit 7, Lesson 1, the materials offer a cumulative practice set that includes opportunities to practice previously learned skills and concepts, including finding the altitude of a triangle, identifying where the diagonals of a parallelogram intersect, and analyzing parallel lines on a coordinate grid. As a further example, the Unit 6, Lesson 5 lesson focuses on the relationships between squares and circles, calling on previously learned skills, including "distributive property... identify[ing] and factoring perfect square trinomials... and completing the square." Throughout the lesson, the materials guide teachers to use multiple strategies to provide spaced retrieval. The lesson "Warm-up" provides a math talk "to elicit strategies and understandings students have for distributing pairs of binomials," skills students learned in previous lessons. During content instruction, teachers "ask students to share their strategies for determining which trinomials were perfect squares, and for rewriting those expressions" (previously learned concepts), and "students rewrite 2 perfect square trinomials in factored form, then identify the center and radius of the circle" (previously learned skills and concepts), tying the spaced retrieval content to new content. In the "Cool-down," students are directed to "Find the center and radius of the circle with this equation," requiring prior knowledge of factoring polynomials (spaced retrieval) to determine the center and radius of the circle (new content).
- In Unit 1, Lesson 9, a "Cumulative Set" contains various questions providing opportunities to demonstrate learned skills from the unit: "Which construction can be used to determine whether point C is closer to point A or point B?" Constructions were introduced/practiced in other lessons in Unit 1. Another question is, "The diagram is a straightedge and compass construction. Lines ℓ, m, and n are the perpendicular bisectors of the sides of triangle ABC. Select all the true statements." The Unit 9 Narrative says, "In this lesson, students build on their experiences with perpendicular bisectors to answer questions about allocating resources in a real-world situation."

- Materials provide modeling examples, tasks, and/or discussion prompts that activate students' prior knowledge of preceding concepts as an access point for building new mathematical understanding. In Unit 5, Lesson 5.2, students use grade 7 concepts to build complexity and analyze intersections of solids and planes by slicing the solid. "In grade 7, students described the two-dimensional figures that result from slicing three-dimensional figures. Here, these concepts are revisited with some added complexity. Students analyze cross sections, or the intersections between planes and solids, by slicing three-dimensional objects. Next, they identify three-dimensional solids given parallel cross-sectional slices. In addition, they revisit solid geometry vocabulary terms from earlier grades: sphere, prism, cylinder, cone, pyramid, and faces."

Materials provide interleaved practice opportunities with previously learned skills and concepts across lessons and units.

- Materials provide interleaved opportunities with previously learned skills and concepts across lessons by providing cumulative practice sets at regular intervals in each unit. For example, after studying cylinder volumes in Unit 5, Lesson 9, the materials offer a cumulative practice set for students to practice what they have learned throughout the unit, such as finding the volume of a hexagonal prism and a triangular prism. As a further example, Unit 1, Lesson 17, states, "In previous grades, students describe a sequence of rigid transformations that exhibits the congruence between two figures. To prepare students for future congruence proofs, this lesson asks students to come up with a systematic, point-by-point sequence of transformations that will work to take any pair of congruent polygons onto one another." Students are given a picture of two intersecting lines and then asked to provide "A transformation that takes A to B."
- The materials include practice opportunities that require students to choose strategies, promoting the use of the most efficient method rather than relying on a single method to solve every problem. For example, students can use algebra or trigonometric ratios to calculate angle measures that are missing and find missing lengths of sides. "Special right triangle relationships give students the experience of knowing an angle measurement and a single side length and being able to figure out the other sides, which previews trigonometry. In addition, knowing some ratios of side lengths for certain angle measures provides a reference point as students begin filling in tables of trigonometric ratios."

Balance of Conceptual and Procedural Understanding

5.1	Development of Conceptual Understanding	18/18
5.1a	Questions and tasks require students to interpret, analyze, and evaluate a variety of models and representations for mathematical concepts and situations.	**12/12**
5.1b	Questions and tasks require students to create a variety of models to represent mathematical situations.	**2/2**
5.1c	Questions and tasks provide opportunities for students to apply conceptual understanding to new problem situations and contexts.	**4/4**

Questions and tasks require students to interpret, analyze, and evaluate a variety of models and representations for mathematical concepts and situations. Questions and tasks require students to create a variety of models to represent mathematical situations. Questions and tasks provide opportunities for students to apply conceptual understanding to new problem situations and contexts.

Evidence includes, but is not limited to:

Questions and tasks require students to interpret, analyze, and evaluate a variety of models and representations for mathematical concepts and situations.

- Unit 2, Lesson 1 includes questions in the "Cumulative Practice Problems" section that require students to interpret, analyze, and evaluate models and representations for mathematical concepts. For example, a question in the Unit 2, Lesson 1, Cumulative Practice Problems provides a model of a rectangle with labeled vertices and asks, "When rectangle $ABCD$ is reflected across line EF, the image is $DCBA$. How do you know that segment AB is congruent to segment DC?"
- In Unit 4, "Check Your Readiness," students interpret, analyze, and evaluate information from a given model. Question 1 shows two triangles formed by parallel lines and transversals and asks, "Which angle is complementary to angle BAC?" To answer the question, students interpret the location of angle BAC, analyze the model to determine supplementary, complementary, and congruent angles, and evaluate the angle(s) complementary to angle BAC.
- The materials prompt students to engage in various models and representations to interpret, analyze, and evaluate various concepts. For example, in Unit 1 "End of Unit Assessment," Question 3, students use a model to analyze what rigid transformations could be used on AEFB to become CFED. The students use logical reasoning to determine the transformations that have transpired in a multiple-answer selection.
- In Unit 2, Lesson 13, the "Notice and Wonder" task requires students to interpret and analyze models for mathematical concepts and situations. Students interpret and analyze models of a parallelogram and a rectangle as they share what they notice and wonder about the figures to "elicit the idea that the diagonals of a parallelogram bisect each other and the diagonals of a rectangle are congruent."

- A task in Unit 6, "Check Your Readiness," requires students to interpret, analyze, and evaluate information given a model. Question 1 provides two-line segments on respective coordinate planes, directing students to "calculate the length of each line segment." Students interpret the endpoints of each line segment using the coordinate plane, analyze the information to substitute into the distance formula, and evaluate the distance between the points, interpreting that the distance between endpoints is the length of the segment.
- In Unit 7, Lesson 14, "Putting it all together," students interpret, analyze, and evaluate a variety of representations. For example, "choose a group who chose vendor A because it represents the least expensive unit cost. Then, choose a group who chose a different vendor based on other variables. Ask students how they could quantify some of these other variables (Students could calculate the volume of the pizza if crust thickness is important to them. They could try to figure out a calorie count if they want the most energy for their money. They could create an expression that assigns relative importance to toppings, size, and crust type.)."

Questions and tasks require students to create a variety of models to represent mathematical situations.

- The materials contain Cumulative Practice Problem sets that include questions requiring students to create models representing mathematical situations. For example, in Unit 6, Lesson 2, students draw an image of a triangle on a coordinate grid under a given set of transformations and then later describe a single transformation that would have the same result.
- The materials provide questions requiring students to create a proof (model) to represent their thinking in a mathematical situation. For example, Question 4 from Unit 2, "Geometry.2 End Of Unit Assessment," directs students to "Prove segment AM is congruent to segment CM: when given a diagram of the described parallelogram. The question requires students to create a model of their thinking using a proof as the representation of the model.
- The Cumulative Practice Problems include tasks that allow students to create various models representing mathematical situations. For example, in Unit 1, Lesson 3, a task from the Cumulative Practice Problems prompts students to determine if point E is closer to point A, closer to point B, or the same distance between the points. Students must submit their work to complete the task, choosing from the following tools: Draw, Write, Upload Photo, or Record Audio or Video.
- Materials direct students to complete a task by creating written responses. For example, in Unit 8, End of Unit Assessment, Question 5, students are provided a chart with information and create a short-answer response to explain, "What is the probability that the chosen student has taken a public speaking class or is majoring in business administration?" "What does P(taken a public speaking class | majoring in business administration) represent for this survey?" "Find the value of P(taken a public speaking class | majoring in business administration)."
- As a further example, the guidance in Unit 7, "Check Your Readiness" states, "This assessment requires students to do several constructions. Paper folding, compass and straightedge moves are acceptable construction methods. Make tracing paper, compasses, and straightedges available to students."

Questions and tasks provide opportunities for students to apply conceptual understanding to new problem situations and contexts.

- Materials include questions that allow students to apply conceptual understanding to new situations and contexts. For example, in the final lessons of Unit 5, students apply what they have learned about volume to calculate densities. Questions include: "The density of water is 1 gram per cm3. An object floats in water if its density is less than that of water, and it sinks if its density is greater than that of water. Will a toy in the shape of a rectangular prism that is 1 cm by 2 cm by 2 cm, with a mass of 3 grams, sink or float?" and "Suppose a lime with mass 90 grams is in the shape of a sphere with a radius of 2.5 centimeters. Will the lime sink or float in water?"
- Materials include tasks that provide opportunities for students to apply conceptual understanding to new problem situations and contexts. For example, in Unit 2, students "immediately apply theorems they have proven to new contexts in which those theorems help them prove new results." In Lesson 14, students "return to conjectures they made in a previous unit that the construction of an angle bisector is valid and that isosceles triangles have a line of symmetry. Now that students know how to use transformations to prove parts congruent and the triangle congruence theorems, they can prove these conjectures."
- Tasks direct students to take their conceptual knowledge of rigid transformations and apply them to a new context of recreating a design. For example, in Unit 1, Lesson 22, "Part 2," located in "Duplicate a Design," students "begin by examining a design. Next, they work to recreate it and record instructions for another student to make it as they work. This provides opportunities for students to practice their construction techniques while identifying geometric figures and their properties." Students apply their knowledge of "rigid motions (rotation, reflection, or translation) ... in [their] design" by recording their steps so another person can recreate the design."
- Tasks apply conceptual understanding to new problems, situations, and contexts. For example, in Unit 7, Lesson 11.1, "Warm Up": "In this activity, students find arc lengths for common angle measurements in a circle with a radius of 1 unit. This will be helpful when arc lengths in unit circles are used as radian angle measurements in an upcoming activity." Students then share their strategies for solving the problem.

Balance of Conceptual and Procedural Understanding

5.2	Development of Fluency	12/12
5.2a	Materials provide tasks that are designed to build student automaticity and fluency necessary to complete grade-level tasks.	**2/2**
5.2b	Materials provide opportunities for students to practice the application of efficient, flexible, and accurate mathematical procedures within the lesson and/or throughout a unit.	**3/3**
5.2c	Materials provide opportunities for students to evaluate procedures, processes, and solutions for efficiency, flexibility, and accuracy within the lesson and throughout a unit.	**6/6**
5.2d	Materials contain embedded supports for teachers to guide students toward increasingly efficient approaches.	**1/1**

Materials provide tasks that are designed to build student automaticity and fluency necessary to complete grade-level tasks. Materials provide opportunities for students to practice the application of efficient, flexible, and accurate mathematical procedures within the lesson and/or throughout a unit. Materials provide opportunities for students to evaluate procedures, processes, and solutions for efficiency, flexibility, and accuracy within the lesson and throughout a unit. Materials contain embedded supports for teachers to guide students toward increasingly efficient approaches.

Evidence includes, but is not limited to:

Materials provide tasks that are designed to build student automaticity and fluency necessary to complete grade-level tasks.

- The materials provide "Math Talks" designed to build student automaticity and fluency necessary to complete grade-level tasks. In the "Instructional Routines" section of the "Course Guide," the materials explain, "Math Talks build fluency by encouraging students to think about the numbers, shapes, or algebraic expressions and rely on what they know about structure, patterns, and properties of operations to mentally solve a problem."
- In Unit 1, Lesson 19, students participate in a Math Talk that requires them to mentally evaluate all the missing angle measures in each diagram. The materials state, "The purpose of this Math Talk is to elicit strategies and understandings students have for determining the angle measures in pairs of intersecting lines or for pairs of angles that make a straight angle. These understandings help students develop fluency and will be helpful later in this lesson when students will need to be able to explain why vertical angles are congruent."
- Unit 5, Lesson 6, Section 1 employs a Math Talk strategy designed to "help students develop fluency and... analyze the effect of scaling on cube volumes." Using this strategy, teachers build student fluency while connecting the knowledge to content-level concepts. Unit 7, Lesson 8.1, "Warm-Up" is a Math Talk designed to build student fluency necessary to complete grade-level tasks: "These understandings help students develop fluency and will be helpful later in this lesson when students will develop general methods for calculating sector areas and arc lengths."

Materials provide opportunities for students to practice the application of efficient, flexible, and accurate mathematical procedures within the lesson and/or throughout a unit.

- Materials provide opportunities to apply efficient, flexible, and accurate mathematical procedures. In Unit 8, Lesson 12, after learning about the arc lengths of circles and radians, students complete the following practice problem: "Calculate the radian measure of a 30-degree angle. Use any method you like, including sketching in the circle diagram provided. Explain or show your reasoning."
- Materials provide opportunities to apply efficient and accurate mathematical procedures. For example, in Unit 3, Lesson 10, students learned how to use specific triangle theorems to shorten proofs efficiently. During the "Lesson Synthesis," the teacher displays a set of triangles and asks, "Which of these pairs of triangles can we now prove are similar using one of our shortcuts?"
- Through Unit 8, Lesson 5, "Geometry.8.B5 Cumulative Pp Set For Combining Events," materials promote student practice of efficient mathematical procedures concerning probability. Students receive various data collection methods, including Venn diagrams (Questions 1 and 2) and tables (Questions 3–5). Because students practice multiple procedures in the same assignment, materials promote efficient practice of the procedures for calculating probability.
- Materials include end-of-unit written assessments of specific lengths and breadth of topics that include problem types intended to gauge understanding of key concepts and prepare students for new-generation test item types. Item types include multiple-choice, multiple-response, short answer, restricted constructed response, and extended response. Problems vary in difficulty and depth of knowledge.
- The materials include tasks that ask students to apply two or more strategies or procedures. For example, in Unit 4, Lesson 2–1.2, "Can You Calculate?" students are given three triangles and must determine if they have enough information to find the values of the three variables. To solve these problems, students may use multiple strategies, such as the Pythagorean Theorem, Special Right Triangles, or Trig Ratios.

Materials provide opportunities for students to evaluate procedures, processes, and solutions for efficiency, flexibility, and accuracy within the lesson and throughout a unit.

- Materials provide lesson-level opportunities for students to evaluate processes and solutions for efficiency, flexibility, and accuracy. For example, in Unit 3, Lesson 10, the 10.2 "Activity Synthesis" states, "The main idea to draw out of this activity is that knowing that the Side-Angle-Side [SAS] Triangle Congruence Theorem is true makes it much easier to prove the [SAS] Triangle Similarity Theorem. Some students might use the dilation-first argument, and other students might define a specific sequence of rigid motions and a dilation without mentioning the [SAS] Triangle Congruence Theorem. Compare the two methods and discuss how the [SAS] Triangle Congruence Theorem gives us an opportunity to shorten our proof by making use of structure." The lesson provides additional opportunities for students to evaluate their

processes for efficiency, flexibility, and accuracy to shorten other proofs as well: "Some students might use the dilation-first argument outlined in the student response, and other students might define a specific sequence of rigid motions and a dilation without mentioning the Side-Side-Side [SSS] Triangle Similarity Theorem. This provides an opportunity to compare the two methods and discuss how the [SSS] Triangle Similarity Theorem gives an opportunity to shorten the proof by making use of structure."

- Materials provide students with opportunities to evaluate procedures, processes, and solutions for efficiency, flexibility, and accuracy at the unit level. For example, in Unit 3, "End-of-Unit Assessment," Question 6, students evaluate the procedures, process, and solution of Tyler's proof that "all rhombuses are similar." When following the instructions, students are to "explain what is wrong with each step that is wrong." Students evaluate for 1) efficiency by noting if Tyler includes extraneous steps, 2) flexibility by noting if Tyler includes a correct process that may be different than the student's own, and 3) accuracy by noting Tyler's accurate or inaccurate steps. Since Question 6 incorporates content from across the unit, students are evaluating the criteria at the unit level.
- The information in Unit 7, Lesson 5, "Lesson Narrative," provides opportunities for students to evaluate procedures, processes, and solutions for efficiency, flexibility, and accuracy throughout the lesson: "In this lesson, students build on this previous work and construct the circumscribed circle of a triangle. First, students recall that points on the perpendicular bisector of a segment are equidistant from the vertices of the segment. Then, they use this property to conclude that all 3 perpendicular bisectors of the sides of a triangle intersect in a single point, the triangle's circumcenter. They construct the circumcenter and circumscribed circle of a triangle and conclude that this method would apply to any triangle. Finally, students investigate the locations of circumcenters in right, obtuse, and acute triangles."
- In Unit 3 End-of-Unit Assessment, Question 4, students are given two triangles and must find the measure of a missing side length. The materials provide teachers with questions for students to consider alternative strategies and think critically about the most efficient approach, as well as finding an alternate solution and applying a procedure to all situations. The students could use ratios, proportions, trig ratios, and proofs using CPCTC to solve for the missing side length.

Materials contain embedded supports for teachers to guide students toward increasingly efficient approaches.

- Materials contain embedded discussion questions for teachers to guide students towards increasingly efficient approaches. For example, in Unit 8, Lesson 6, the materials provide the following discussion question and sample student responses for teachers to use while learning about the addition rule for probability: "'How did you know you needed to use the addition rule to do the first question?' (I knew to use the addition rule because I was asked to find the percentage who used 'cream or sugar' and was given percentages involving the cream, the sugar, and the cream sugar. It made sense to substitute these values into the addition rule. I thought about using a Venn diagram, but it seemed easier just to use the addition rule)."

- As a specific example of embedded supports, the materials include details in the Lesson Synthesis section of Unit 3, Lesson 16, that direct teachers to guide students "to choose and defend their thinking" and then "encourage them to check each other's work using another method. Why should both methods give the same answer?"
- Unit 7, Lesson 8.3 contains embedded supports for teachers to guide students toward increasingly efficient approaches: "Choose previously identified students to share their strategies in this order: first, a student who gave a description in words; next, one who created a formula such as $\theta 360 \cdot \pi r 2$. If no student created a formula, invite students to rewrite their method using symbols instead of words."
- The materials include scaffolded instruction starting with simpler problems and gradually progressing to more complex problems to support students' development of efficient approaches. For example, Unit 3, Lesson 15, Lesson Synthesis states, "When finding all the unknown values in similar right triangles you have choices: you can use proportional relationships or the Pythagorean Theorem. Which would you choose for each of these examples and why?... After students choose and defend their thinking, encourage them to check each other's work using another method. Why should both methods give the same answer? (The side lengths don't change just because how we calculate them does.)"

Balance of Conceptual and Procedural Understanding

5.3	Balance of Conceptual Understanding and Procedural Fluency	14/16
5.3a	Materials explicitly state how the conceptual and procedural emphasis of the TEKS are addressed.	**0/2**
5.3b	Questions and tasks include the use of concrete models and manipulatives, pictorial representation (figures/drawings), and abstract representations.	**6/6**
5.3c	Materials include supports for students in connecting, creating, defining, and explaining concrete and representational models to abstract (symbolic/numeric/algorithmic) concepts.	**8/8**

Materials do not explicitly state how the conceptual and procedural emphasis of the TEKS are addressed. Questions and tasks include the use of concrete models and manipulatives, pictorial representation (figures/drawings), and abstract representations. Materials include supports for students in connecting, creating, defining, and explaining concrete and representational models to abstract (symbolic/numeric/algorithmic) concepts.

Evidence includes, but is not limited to:

Materials explicitly state how the conceptual and procedural emphasis of the TEKS are addressed.

- Materials include a "Scope and Sequence" document that identifies the TEKS addressed in each unit. For example, in Unit 5, the TEKS section lists 10.A, 10.B, 11.A, 11.B, 11.C, 11.D, but it does not explicitly state how the conceptual and procedural emphasis of the TEKS are addressed.

Questions and tasks include the use of concrete models and manipulatives, pictorial representation (figures/drawings), and abstract representations.

- Questions include concrete, pictorial, and abstract representations as appropriate. For example, Unit 5, Lesson 2, "Cool-down" provides an image of a square pyramid and states, "Here is a square pyramid. For each plane described, sketch the cross section that results from the intersection of the pyramid and the plane. The materials also suggest the teacher "Consider providing a physical square pyramid for students who would find that helpful."
- Questions in Unit 8, Lesson 9, in the "Geometry.8.C9 Cumulative Pp Set For Using Tables For Conditional Probability" section include the use of concrete models and abstract representations to aid students in computing conditional probability. In Question 1, the materials include a concrete model of a "two-way table summarizes[ing] whether or not customers saw dolphins on a total of 40 different trips as visual stimuli for parts A and B. For part C, students use abstract representations to determine if 'the events of seeing dolphins and the time of the trip (morning or afternoon) dependent or independent events?'"

- In Unit 7, Lesson 3, the "Cumulative Pp Set for Tangent Lines" section provides questions that include concrete, pictorial, and abstract representations as appropriate. For example, "The image shows a circle with diameters AC and BD. Prove that chords BC and AD (not drawn) are congruent," and "the line represented by y+3=-3(x+6) is transformed by the rule (x,y)→(-x,-y). What is the slope of the image?"
- The materials clearly outline how conceptual understanding relates to procedural by providing a process of developing mastery of abstract representation. In Unit 4, Lesson 4.2, "Tons of Triangles," the "Activity Narrative" opens with students working with paper to build triangles and create a table of values to identify similarities, with the objective being to build a bank of trig ratio values. The completed table will be used in Lesson 3 to work more abstractly with trig ratios: "In this activity, students begin to build a table of trigonometric ratios (ratios of side lengths in right triangles, by angle measure of one acute angle). For now, call this the right triangle table so students remember these ratios only apply to right triangles. Building these ratios from the similar triangles they are based on helps students build connections between similar triangles and trigonometry. Measuring several examples of triangles with the same angle measurements is essential in both the digital and paper versions of this activity. In the paper version, it provides more data points to get a more accurate ratio for the given angle. In both versions, it helps students understand that all right triangles with their angle as one of the angles will be similar and thus have the same ratios."
- Tasks include concrete, pictorial, and abstract representations appropriate for the lesson. For example, in Unit 2, Lesson 10, "students first use manipulatives to make conjectures about diagonals of quadrilaterals. Then they have a chance to practice using diagrams to recognize when the Side-Side-Side, Angle-Side-Angle, and Side-Angle-Side Triangle Congruence Theorems apply. Finally, students match diagrams with statements about quadrilaterals and write a proof using the analyses they did earlier."

Materials include supports for students in connecting, creating, defining, and explaining concrete and representational models to abstract (symbolic/numeric/algorithmic) concepts.

- Materials include discussion questions to support students in connecting, defining, and explaining representational models to abstract concepts. For example, during Unit 8, Lesson 6, "Lesson Synthesis," materials guide the teacher to prompt students to describe a situation in which they could apply the Addition Rule and how they would solve it. The teacher asks, "'What does a Venn diagram look like that represents this situation?' (The portion that overlaps is 50%. That leaves 20% in a club but not playing a sport, and 10% playing a sport but not in a club.)"
- Materials support connecting, creating, defining, and explaining concrete models to abstract concepts. For example, in Unit 5, Lesson 2, students explore cross-sections of three-dimensional solids made in class with dental floss. The materials guide teachers to support students in making connections between the concrete model and abstract concept by providing questions for discussion, including, "Were there any cross sections that caught you by surprise?" "Compare and contrast the different cross sections of a sphere." "How are a cube's cross sections different from a sphere's?"

- The Unit 6 "End of Unit Assessment" section supports students in connecting, creating, defining, and explaining concrete models to abstract concepts. Given a graph for "Figure F," students must "Transform figure F using the rule $(x,y)\rightarrow(-x,y-8)$," creating a concrete representation (graph) using an abstract concept (rule). Following the graph sections, students must "Describe the transformation precisely," explaining the abstract (rule) and the concrete (transformed graph). Finally, in Part C, students must answer the question, "Does the transformation result in a figure that is congruent to the original, similar to the original, both, or neither?"
- In the "Access for Students with Disabilities" section of Unit 7, Lesson 3, teachers find support in connecting, creating, defining, and explaining concrete models to abstract concepts: "For example, students can physically demonstrate the different parts of circles that they constructed in the lesson with a mug and a straightedge or pencil, describing them in mathematical language."

Balance of Conceptual and Procedural Understanding

5.4	Development of Academic Mathematical Language	14/14
5.4a	Materials provide opportunities for students to develop their academic mathematical language using visuals, manipulatives, and other language development strategies.	**3/3**
5.4b	Materials include embedded guidance for the teacher addressing scaffolding and supporting student development and use of academic mathematical vocabulary in context.	**2/2**
5.4c	Materials include embedded guidance for the teacher to support the application of appropriate mathematical language to include vocabulary, syntax, and discourse to include guidance to support mathematical conversations that provide opportunities for students to hear, refine, and use math language with peers and develop their math language toolkit over time as well as guide teachers to support student responses using exemplar responses to questions and tasks.	**9/9**

Materials provide opportunities for students to develop their academic mathematical language using visuals, manipulatives, and other language development strategies. Materials include embedded guidance for the teacher addressing scaffolding and supporting student development and use of academic mathematical vocabulary in context. Materials include embedded guidance for the teacher to support the application of appropriate mathematical language to include vocabulary, syntax, and discourse to include guidance to support mathematical conversations that provide opportunities for students to hear, refine, and use math language with peers and develop their math language toolkit over time as well as guide teachers to support student responses using exemplar responses to questions and tasks.

Evidence includes, but is not limited to:

Materials provide opportunities for students to develop their academic mathematical language using visuals, manipulatives, and other language development strategies.

- In Unit 2, Lesson 15, the materials provide opportunities for students to develop mathematical language using manipulatives as the teacher launches "Activity 15.3." Students "use virtual or concrete manipulatives to connect symbols to concrete objects or values. For example, straightedge, compass, card stock, and metal fasteners, or dynamic geometry virtual software" as they test their understanding of why congruence theorems do or don't work.
- Unit 5, Lesson 10 provides opportunities for students to develop mathematical language with visuals using the "Co-Craft Questions" instructional routine. The materials explain, "Use this routine to increase awareness of the language used to talk about the cross sections and volumes of rectangular prisms. Before revealing the questions in this activity, display the image of both prisms along with the statement: 'The image shows two rectangular prisms,' and ask students to write down possible mathematical questions that could be asked about the image. Invite students to compare their questions before revealing the actual questions. Listen for and amplify any questions about the cross sections and volumes of both prisms. For

example, 'Do both prisms have the same cross sections?' and 'Do both prisms have the same volume?'"

- In Unit 4, Lesson 4, Section 4.3, the "Launch" section includes a language development strategy titled "Stronger and Clearer Each Time." Students start by responding to the given prompts, then receive time "with 2-3 partners to share and receive feedback on their responses." As a visual, teachers can "display feedback prompts that will help students strengthen their ideas and clarify their language. For example, 'How do you know that the area of each rectangle is multiplied by $k2$?' and 'How do you know that the area of the dilated blob is also multiplied by $k2$?' The language development happens both from the feedback from partners and when students receive time "to go back and revise or refine their written responses based on the feedback from peers."
- In Unit 7, Lesson 1, the "Lesson Narrative" includes opportunities for students to develop academic mathematical language using visuals. For example, "Students begin this lesson by discussing what they notice and wonder about several images of circles that contain different kinds of line segments. Then, they are introduced to the vocabulary terms chord (a segment whose endpoints are on a circle), central angle (an angle formed by 2 rays whose endpoints are the center of the same circle), and arc (the portion of a circle between 2 endpoints)."
- The materials describe the development of mathematical vocabulary by first creating a need for the language through carefully designed tasks, visuals, and manipulatives that provide opportunities for students to read and listen to new words in context and then apply those words in their speaking and writing: "Start the synthesis as soon as students have had a chance to think about all the questions. They will have the opportunity to formalize their language and arguments during the discussion."

Materials include embedded guidance for the teacher addressing scaffolding and supporting student development and use of academic mathematical vocabulary in context.

- The materials include embedded guidance for supporting student development and use of academic vocabulary in warm-up prompts using "Which One Doesn't Belong" activities. For example, in Unit 8, Lesson 1, the materials provide four images for spinners and ask students to consider which one doesn't belong: "This warm-up prompts students to compare four images. It gives students a reason to use language precisely...It gives the teacher an opportunity to hear how they use terminology and talk about characteristics of the items in comparison to one another." Also, in Unit 3, Lesson 6, Section 6.3, the Launch materials embed guidance for teachers to support student development and use of academic language. While students complete a card sort activity, the teacher monitors discussion for language, "Write[ing] the students' words and phrases on a visual display." Once students complete the sort, they "review the visual display," and the teacher "ask[s] them to revise and improve how ideas are communicated... This will help students use the mathematical language necessary to justify their reasoning for placing a card in a category."
- Unit 6, Lesson 3 includes embedded guidance for scaffolding student development and using academic vocabulary as students learn to write Transformation rules. The materials provide questions to elicit the language of distance-preserving and angle-preserving moves in

describing two transformations, including "Look at the corresponding side lengths and angles in the 2 pairs of triangles. How do they compare?" "What would a transformation look like if it kept the angles the same but not the side lengths?" "Is it possible for a transformation to keep side lengths the same but not keep the angles the same?" As a further example, in Unit 7, Lesson 1.4 includes embedded guidance for scaffolding development and the use of academic mathematical vocabulary in context: "Students will have more opportunities to understand the mathematical ideas in this cool-down, so there is no need to slow down or add additional work to the next lessons. Instead, use the results of this cool-down to provide guidance for what to look for and emphasize over the next several lessons to support students in advancing their current understanding."

- The materials include scaffolds teachers can use for students as they develop and use academic vocabulary. For example, the materials include suggestions for developing word walls, vocabulary journals, sentence frames, peer discussions, concept mapping, or written assignments: "Arrange students in groups of 2. After quiet work time, ask students to compare their responses to their partner's and decide if they are both correct, even if they are different. Follow with a whole-class discussion. Create a display of important terms and vocabulary. Invite students to add labels to the triangle that will support their understanding of equilateral, angle bisector, incenter, and circumcenter."

Materials include embedded guidance for the teacher to support the application of appropriate mathematical language to include vocabulary, syntax, and discourse to include guidance to support mathematical conversations that provide opportunities for students to hear, refine, and use math language with peers and develop their math language toolkit over time as well as guide teachers to support student responses using exemplar responses to questions and tasks.

- Materials provide opportunities for students to hear, refine, use, and develop math language and academic vocabulary in conversations with other students using the "Discussion Supports" instructional routine. For example, in Unit 4, Lesson 1, the materials suggest, "Use this routine to support whole-class discussion. For each student that shares, ask peers to restate what they heard using precise mathematical language. Consider providing students time to restate what they hear to a partner before selecting one or two students to share with the class. Ask the original speaker if their peer was accurately able to restate their thinking. Call students' attention to any words or phrases that helped to clarify the original statement. This provides more students with an opportunity to produce language as they interpret the reasoning of others."
- In Unit 1, Lesson 1, the materials provide embedded guidance for teachers using the "Stronger and Clearer Each Time" instructional routine to support students' use of academic vocabulary, syntax, and discourse in mathematical conversation as they hear, use, and refine mathematical language in a "Support for English Language Learners" section: "Use this with successive pair shares to give students a structured opportunity to revise and refine their response to 'How do you know each of the sides of the shape are the same length?' Ask each student to meet with 2–3 other partners in a row for feedback. Provide students with prompts for feedback that will help individuals strengthen their ideas and clarify their language. For example, 'Can you explain how...?' 'How do circles help with the construction?' 'What do you

know about radii that helps here?' 'What do you mean by...?' Students can borrow ideas and language from each partner to strengthen their final explanation."

- Unit 1, Lesson 15, Section 15.3 includes embedded guidance for teachers to support mathematical conversations that provide opportunities for students to hear, refine, and use math language with peers and develop their math language toolkit. Using the "Stronger and Clearer Each Time" routine, teachers give students the opportunity to work with "successive pair shares to give students a structured opportunity to revise and refine their response" using grade-level and content-appropriate vocabulary. Because students work in pairs for this routine, they hear math language from other students and use math language to communicate their responses. Appearing multiple times throughout each unit, the routine develops students' math language toolkit across the curriculum.
- In Unit 7, Lesson 2.1, the Launch section provides opportunities for students to hear, refine, use, and develop math language in conversations with other students: "Display the image for all to see. Ask students to think of at least one thing they notice and at least one thing they wonder. Give students 1 minute of quiet think time, and then 1 minute to discuss the things they notice with their partner, followed by a whole-class discussion."
- In Unit 5, Lesson 1, Section 1.3 highlights mathematical vocabulary and syntax developed within the unit and identifies academic vocabulary from prior units and grades. The beginning of the "Lesson Narrative" outlines for teachers that the vocabulary started being developed in grade 6. "As students share their justification for why the two-dimensional figure will produce the three-dimensional solid, ask students to restate what they heard using precise mathematical language. Consider providing students time to restate what they hear to a partner before selecting one or two students to share with the class. Ask the original speaker if their peer was accurately able to restate their thinking. Call students' attention to any words or phrases that helped to clarify the original statement, such as axis of rotation and 360 degrees. This provides more students with an opportunity to produce language as they interpret the reasoning of others."

Balance of Conceptual and Procedural Understanding

5.5	Process Standards Connections	6/6
5.5a	Process standards are integrated appropriately into the materials.	**1/1**
5.5b	Materials include a description of how process standards are incorporated and connected throughout the course.	**2/2**
5.5c	Materials include a description for each unit of how process standards are incorporated and connected throughout the unit.	**2/2**
5.5d	Materials include an overview of the process standards incorporated into each lesson.	**1/1**

Process standards are integrated appropriately into the materials. Materials include a description of how process standards are incorporated and connected throughout the course. Materials include a description for each unit of how process standards are incorporated and connected throughout the unit. Materials include an overview of the process standards incorporated into each lesson.

Evidence includes, but is not limited to:

Process standards are integrated appropriately into the materials.

- The materials include a How to Use These Materials section that contains The Math Process Standards Chart. The chart outlines the TEKS process standards that are integrated in the materials.
- The materials include evidence of the process standards within the Activity Narrative description of each lesson. The mathematics process standards aligned to the lesson are in parentheses at the end of the description.

Materials include a description of how process standards are incorporated and connected throughout the course.

- The How to Use These Materials section describes how process standards are incorporated and connected throughout the course. It states, "The Math Process Standards describe the types of thinking and behaviors students engage in as they are doing mathematics." For example, "Students have an opportunity to explore the tools before they are asked to use them to represent mathematical situations in later lessons."
- The online materials include evidence of a description of how process standards, or mathematical practices, are connected throughout the course. In the How to Use These Materials section of the Teacher Guide, there is a Math Process Standards Chart section that states, "Teachers will notice that some instructional routines are generally associated with certain mathematical practices." Following, there is a description of how instructional

routines throughout the course align with mathematical practices. The chart also demonstrates how process standards connect throughout the course.

Materials include a description for each unit of how process standards are incorporated and connected throughout the unit.

- The materials include a description of how the process standards are connected throughout each unit in the "Unit Narrative." For example, in Unit 2, the Unit Narrative includes the following descriptions of student learning and activities: "Students justify that for each set of criteria, a sequence of rigid motions exists that will take one triangle onto the other." "In this unit, students learn to explain how two triangles with all three pairs of corresponding side lengths congruent can be taken onto one another using a more general sequence of rigid motions." "Students will justify how they know that a given sequence of transformations will result in the vertices coinciding." "For most activities in this unit, students have access to a geometry toolkit that includes many tools that students can choose from strategically: compass and straightedge, tracing paper, colored pencils, and scissors."
- The materials include a description for each unit of how process standards are incorporated and connected throughout the unit. In the How to Use These Materials section, there is a Math Process Standards Chart. This chart correlates the process standards present in each unit of the materials and each lesson.
- The materials include a Process Standards Integration Document for the TEKS and illustrate how the process standards build and connect throughout the units by connecting the student expectation with a narrative description of how the process standard(s) are represented in the units.

Materials include an overview of the process standards incorporated into each lesson.

- The materials include a description for each unit of how process standards are incorporated in the lessons. In the How to Use These Materials section, there is a Math Process Standards Chart. This chart provides a useful overview of how the process standards are incorporated into each lesson.
- Mathematical Process Standards are found in the warm-up activity of every lesson throughout the units. In the A Typical IM Lesson section, the materials state that the warm-ups "place value on students' voices as they communicate their developing ideas, ask questions, justify their responses, and critique the reasoning of others."

Productive Struggle

6.1	Student Self-Efficacy	15/15
6.1a	Materials provide opportunities for students to think mathematically, persevere through solving problems, and to make sense of mathematics.	**3/3**
6.1b	Materials support students in understanding, explaining, and justifying that there can be multiple ways to solve problems and complete tasks.	**6/6**
6.1c	Materials are designed to require students to make sense of mathematics through doing, writing about, and discussing math with peers and teachers.	**6/6**

Materials provide opportunities for students to think mathematically, persevere through solving problems, and to make sense of mathematics. Materials support students in understanding, explaining, and justifying that there can be multiple ways to solve problems and complete tasks. Materials are designed to require students to make sense of mathematics through doing, writing about, and discussing math with peers and teachers.

Evidence includes, but is not limited to:

Materials provide opportunities for students to think mathematically, persevere through solving problems, and to make sense of mathematics.

- The materials provide opportunities for students to persevere through solving problems by guiding teachers in responding to anticipated misconceptions. For example, in Unit 4, Lesson 11, the materials suggest, "If students are struggling, invite them to go back to the problems from the previous lesson to generalize the process. (Draw in the altitude. Find the measure of the central angle. Find the length of the opposite leg.) Suggest students generalize each step before trying to write a single formula."
- Materials regularly provide activities that allow students to make sense of the mathematics they are learning. For example, in Unit 1, Lesson 21, "Students work on two proofs. Similar to the previous lesson, one proof uses a 180-degree rotation, and the other uses translations. Students make use of structure when they compare various triangles and observe that the same arguments work to prove the Triangle Angle Sum Theorem regardless of what triangle they start with."
- As a further example of sensemaking, Unit 4, Lesson 1 states, "As students complete this activity, they ask themselves whether they have enough information to find unknown side lengths in right triangles, and if not, what information they might need. Students may notice that without two side lengths given, they can't use the Pythagorean Theorem to find the length of the third side. In the synthesis, there is an opportunity to connect back to what students know about triangle similarity and congruence, and to preview the fact that while we don't yet have enough information to find the length z, the length z is fixed once we know the measures of angles G and H and the length of GH."
- Materials provide opportunities for students to think mathematically. For example, in Unit 6, Lesson 3, the "Lesson Activity" begins, "analyze the results of the transformation rule

$(x,y)\rightarrow(3x,3y)$... connect[ing] the geometric definition of a dilation to this coordinate rule that produces a dilation," then "add these auxiliary points and lines to create 2 right triangles." Then, students must consider the following questions: "How do triangles PMB and PNB' compare? How do you know? What must be true about the ratio $PB : PB$'?" The lesson concludes with a teacher-led discussion, including the following questions: "Why does it make sense that the ratios of the legs of the triangles were both 1:3?" "Look at the definition of a dilation on your reference chart. How does it match what's happening to the coordinate rule $(x,y)\rightarrow(3x,3y)$?" The questions provide opportunities for students to think mathematically by starting with a visual representation with coordinate notation, comparing the lengths of a 1:1 ratio and a 1:3 ratio visually, and connecting the ratio to the scale factor in the coordinate notation rule.

Materials support students in understanding, explaining, and justifying that there can be multiple ways to solve problems and complete tasks.

- Materials support students in understanding, explaining, and justifying multiple ways to solve problems. In Unit 7, Lesson 8, students use their choice strategies to find a circle's sector. The materials suggest that teachers "Select previously identified students to share their strategies for the final problem in this order: first, a student who recognized that a 135-degree sector is 3/8 of a circle; second, a student who divided 135 by 360 to get 0.375. Ask students the advantages and disadvantages of each approach. The second approach works for any central angle, while the first approach may be faster. The first approach may lead to an intuitive estimate that allows for easy recognition of calculation errors, and it always results in an exact answer that does not require approximation or rounding."
- Materials support students in understanding that there can be multiple ways to complete tasks. For example, in Unit 2, Lesson 13 provides teachers with guidance for leading an activity that helps students see multiple approaches to a task, stating, "Stating the goal of the proof in different ways may help students see a different path to the proof. For example, the proof can be restated as 'Show that the midpoint of AC and the midpoint of BD are the point of intersection.' This might suggest a transformation approach based on rotating 180 degrees using the midpoint of AC as the center. Monitor for different approaches to the proof."
- Materials explain that the "MLR7 Compare and Connect" routine supports students in understanding, explaining, and justifying multiple ways to solve problems and complete tasks. For example, in Unit 7, Lesson 14, "Activity 14.2," the teacher is to "call students' attention to the different approaches to rewriting the expressions in standard form" and "amplify student words and actions that describe the connections between a specific feature of one mathematical representation and a specific feature of another representation," enabling students to justify their thought processes using precise mathematical language.
- As a further example of supporting understanding multiple methods, in Unit 4, Lesson 2 guides the teacher to "Invite students to explain the reasoning behind each. Encourage students to think about which answers are most accurate, and which are most efficient. (The first two methods are equally accurate, but the first probably took more calculation, while the second could be found using scale factors quite easily. The third answer was obtained by using a calculator to evaluate either of the first two answers, which loses efficiency and accuracy. The

fourth answer is very efficient, as it was found using scale factors, but is a bit less accurate. For some applications, the fourth answer may be best, and it's great for estimating)."

Materials are designed to require students to make sense of mathematics through doing, writing about, and discussing math with peers and teachers.

- Materials include learning goals in each lesson specifically designed to require students to make sense of mathematics through doing, writing, and discussing math with peers and teachers. Each learning goal specifies whether the goal is met by writing, orally describing, or doing mathematics. For example, in Unit 8, Lesson 2, learning goals include "Describe (in writing) the sample space for chance experiments. Use the sample space to calculate the probability of compound events" and "Generate (in writing) and critique (orally) probability models that meet specific criterion." Unit 8, Lesson 5 learning goals include "Interpret (orally and in writing) Venn diagrams and tables to describe events composed of other events" and "Calculate the probability of events using information in tables and in Venn diagrams." The second goal does not specify "in writing" or "orally" because students are expected to do the mathematics by calculating probability.
- Materials require students to make sense of mathematics by discussing math with peers and teachers. For example, in Unit 5, Lesson 18, "Lesson Synthesis" provides discussion questions and teacher guidance for facilitating class discussions about using graphs to solve problems involving geometric contexts, including, "'Suppose you want to know the radius of different spheres with volumes 100, 200, 300, 400, and so on. What are some ways to find the radii that produce these volumes?' (Substitute each volume into the formula and solve for r repeatedly. Or, solve for r in terms of V and substitute each volume into that expression. Alternatively, solve for r and represent the relationship with a graph, then use the graph to estimate each radius.)" The teacher and students then consider and discuss the advantages and disadvantages of these different techniques.
- Materials provide students with the "Notice and Wonder" and "MLR1: Stronger and Clearer Each Time" routines to make sense of mathematics through writing about and discussing math with peers and teachers. For example, in Unit 3, Lesson 14, "Activity 14.3" Notice and Wonder routine, students write about their observations and inferences and discuss their findings in a teacher-led discussion. When supplemented with the MLR1: Stronger and Clearer Each Time routine, students take their writing to be critiqued in a peer-to-peer process, "meet[ing] with 2-3 partners to share and receive feedback on their responses." After discussing their writing with multiple partners, students "revise or refine their written responses based on the feedback from peers." Using both routines in this lesson activity, students discuss and write about math with peers and discuss math with the teacher.

Productive Struggle

6.2	Facilitating Productive Struggle	10/10
6.2a	Materials support teachers in guiding students to share and reflect on their problem-solving approaches, including explanations, arguments, and justifications.	**6/6**
6.2b	Materials offer prompts and guidance to assist teachers in providing explanatory feedback based on student responses and anticipated misconceptions.	**4/4**

Materials support teachers in guiding students to share and reflect on their problem-solving approaches, including explanations, arguments, and justifications. Materials offer prompts and guidance to assist teachers in providing explanatory feedback based on student responses and anticipated misconceptions.

Evidence includes, but is not limited to:

Materials support teachers in guiding students to share and reflect on their problem-solving approaches, including explanations, arguments, and justifications.

- Materials support teachers in guiding students to share their problem-solving approaches, including explanations, arguments, and justifications. For example, in Unit 3, Lesson 16, the materials guide teachers to "Invite students to share their brainstorming and record for all to see. Ask students to consider which of these methods seemed to be more accurate, and which proved to be easiest to do. How confident are they of their calculated height? To the nearest yard? To the nearest foot? To the nearest inch?"
- Materials support teachers in guiding students to share and reflect on their problem-solving approaches within the activity suggestions provided in units' section-level planning guides. For example, in Unit 6, activity suggestions when studying transformations in the plane include opportunities for students to reflect and share by responding to questions in a journal or talking them over with someone at home.
- Materials support teachers in guiding students to share and reflect on their problem-solving approaches, including explanations, arguments, and justifications. For example, in Unit 8, Lesson 7, in the "MLR3 Clarify, Critique, Correct" routine, students complete data collection, and the teacher presents a false statement describing the data trend. Students reflect on the approach and share by "identify[ing] the error" in a peer-to-peer discussion and then explain, argue, and justify their "critique [of] the reasoning" the teacher presented in a group discussion.
- Materials support teachers in guiding students to share problem-solving approaches, including explanations, arguments, and justification. For example, in Unit 4, Lesson 6 guides teachers to "arrange students in groups of 2. Ask students to compare their strategy with their partner's and decide if they are both correct, even if they are different." "Encourage and support opportunities for peer collaboration. When students share their work with a partner, display sentence frames to support conversation such as: 'First, I...because...' 'I noticed...so I...' 'Why did you...?' 'I agree/disagree because....'"

Materials offer prompts and guidance to assist teachers in providing explanatory feedback based on student responses and anticipated misconceptions.

- Materials provide prompts and guidance for teachers in providing students with explanatory feedback based on student responses in the "Advancing Student Thinking" component of its lessons. For example, in Unit 5, Lesson 16, the materials state, "Some students may assume that because a square maximizes area for a set perimeter, a cube must maximize surface area for a set volume. It's true that a cube maximizes volume for a set surface area, but not the other way around. Prompt these students to consider the results they are seeing from their classmates' calculations to verify if this assumption holds true. If students struggle to calculate the surface area of their prism, remind them that they can draw the faces of the prism to help them organize their thinking."
- Throughout the course, materials provide "Anticipated Misconceptions" sections to assist teachers in providing explanatory feedback. For example, the Unit 4, Lesson 8, "Anticipated Misconceptions" section guides teachers to provide feedback to learners with prompts for engaging learner thinking. Specifically, materials guide teachers to engage students in "draw[ing] a right triangle and label one of the acute angles θ," while prompting teachers to "Ask them what is the measure of the other acute angle."
- Materials offer prompts and guidance to assist teachers in providing explanatory feedback based on anticipated misconceptions. For example, Unit 4, Lesson 7 guides the teacher to "Provide listeners with prompts for feedback that will help their partner add detail to strengthen and clarify their ideas. For example, students can ask their partner, 'What did you do first?' or 'How did you know to use tangent?' Next, provide students with 3–4 minutes to revise their initial draft based on feedback from their peers. This will help students explain how to use trigonometry to calculate side lengths of right triangles."