

Cengage Learning, Inc.

English Mathematics, Mathematical Models with Applications

Mathematical Models with Applications TX Edition

MATERIAL TYPE	ISBN	FORMAT	ADAPTIVE/STATIC
Full-Subject, Tier-1	9781305215429	Both Print and Digital	Static

Rating Overview

TEKS SCORE	ELPS SCORE	ERROR CORRECTIONS (IMRA Reviewers)	SUITABILITY NONCOMPLIANCE	SUITABILITY EXCELLENCE	PUBLIC FEEDBACK (COUNT)
75.68%	23.08%	2	Flags Addressed	Flags in Report	0

Quality Rubric Section

RUBRIC SECTION	RAW SCORE	PERCENTAGE
1. Intentional Instructional Design	11 out of 28	39%
2. Progress Monitoring	9 out of 26	35%
3. Supports for All Learners	5 out of 27	19%
4. Depth and Coherence of Key Concepts	4 out of 19	21%
5. Balance of Conceptual and Procedural Understanding	19 out of 41	46%
6. Productive Struggle	3 out of 22	14%

Breakdown by Suitability Noncompliance and Excellence Categories

SUITABILITY NONCOMPLIANCE FLAGS BY CATEGORY	IMRA REVIEWERS	PUBLIC	Flags NOT Addressed by November Vote
1. Prohibition on Common Core	0	0	0
2. Alignment with Public Education's Constitutional Goal	0	0	0
3. Parental Rights and Responsibilities	0	0	0
4. Prohibition on Forced Political Activity	0	0	0
5. Protecting Children's Innocence	1	0	0
6. Promoting Sexual Risk Avoidance	0	0	0
7. Compliance with the Children's Internet Protection Act (CIPA)	5	0	0

SUITABILITY EXCELLENCE FLAGS BY CATEGORY	IMRA REVIEWERS
Category 2: Alignment with Public Education's Constitutional Goal	4
Category 6: Promoting Sexual Risk Avoidance	0

IMRA Quality Report

1. Intentional Instructional Design

Materials support educators in effective implementation through intentional course and lesson-level design.

1.1 Course-Level Design

GUIDANCE	SCORE SUMMARY	RAW SCORE
1.1a	The scope and sequence does not include the ELPS taught in the course.	3/4
1.1b	The materials do not include a pacing guide for more than one instructional calendar.	1/2
1.1c	All criteria for guidance met.	2/2
1.1d	The materials do not include protocols for unit and lesson internalization.	0/2
1.1e	The materials do not provide guidance for instructional leaders to support teachers with implementing the materials as designed.	0/2
—	TOTAL	6/12

1.1a – Materials include a scope and sequence outlining the TEKS, ELPS, and concepts taught in the course.

In the "Course Support" documents on the companion site and in the "Overview" section of the *Teacher's Edition*, the materials include a *Planning and Pacing Guide with Extensions*. This document contains a concept overview for each chapter and the Texas Essential Knowledge and Skills (TEKS) covered, but does not include the English Language Proficiency Standards (ELPS).

Each chapter includes an overview of the concepts covered. For example, the Chapter 6 overview states, "Several methods for solving systems of equations such as these will be explored in this chapter." However, the TEKS specific to the chapter are not included.

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).

The "Course Support" documents on the companion site and the "Overview" section in the *Teacher's Edition* include a *Planning and Pacing Guide with Extensions*. This guide includes a chapter breakdown of pacing for varying class lengths but does not include pacing for various instructional calendars by days, i.e., 150, 165, 180.

The pacing guide includes pacing suggestions for "45–50 minute classes" and "block scheduling" for each chapter. This includes suggested activities and an assignment guide.

1.1c – Materials include an explanation for the rationale of unit order as well as how concepts to be learned connect throughout the course.

The materials include a rationale of unit order, as well as how concepts are connected through the course. Chapter introductions connect learning to previous chapters with language such as "As we have seen in previous chapters" and goes on to explain the connection to the chapter associated with it. Section introductions in various chapters also include statements such as "As we have seen in previous chapters" with an explanation of the connecting topics.

1.1d – Materials include protocols with corresponding guidance for unit and lesson internalization.

The materials include lesson overviews before each chapter. There is no evidence of guidance for teachers for unit and lesson internalization.

1.1e – Materials include resources and guidance for instructional leaders to support teachers with implementing the materials as designed.

The materials include lesson overviews before each chapter. There is no evidence of materials to guide instructional leaders to support teachers with implementing the materials as designed.

1.2 Unit-Level Design

GUIDANCE	SCORE SUMMARY	RAW SCORE
1.2a	The materials do not include background content knowledge needed to effectively teach the unit.	1/2
1.2b	The materials do not provide support for families in Spanish.	1/2
—	TOTAL	2/4

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.

The *Teacher's Edition* includes unit overviews found at the beginning of each unit. These overviews include a list of the TEKS, concepts covered, and academic vocabulary that students will encounter within the unit. These are provided in a chart format, listed as opposed to descriptions.

No background content knowledge is provided in these unit overviews.

1.2b – Materials contain supports for families in both Spanish and English for each unit with suggestions on supporting the progress of their student.

On the companion site within the "Course Support" section, there is a section titled "Support for Multilingual Families." The materials include letters for families for each chapter that outline ways that families can support their learners in English-language acquisition as well as vocabulary support. These letters are provided in English only.

1.3 Lesson-Level Design

GUIDANCE	SCORE SUMMARY	RAW SCORE
1.3a	The materials do not include lesson plans, language standards, daily aligned objectives, "check-for-understanding" questions, questions to promote the use of language, a list of materials, or a reference to how mastery of content standards will be assessed.	2/8
1.3b	The materials do not provide timing for specific lesson components. Mention was made of materials that were needed from the "Teacher Resource Binder" and the CD-ROM, but these were not provided for review.	1/3
1.3c	The materials do not contain guidance on the use of the extension activities.	0/1
—	TOTAL	3/12

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 (aligned with the TEKS and the ELPS).

The *Teacher's Edition* includes a "Planning Guide," which contains brief summaries of the content standards of the lessons, including a list of the TEKS and verbal description of the content covered in the chapter. The materials outline tasks to promote mastery of the lesson practice.

The materials do not include comprehensive, structured, detailed lesson plans. There is no evidence of the material being aligned to the ELPS to meet the language standards of each lesson.

The materials do not include "check-for-understanding" questions, materials needed, questions to promote language mastery, or daily objectives.

1.3b – Materials include a lesson overview listing the teacher and student materials necessary to effectively deliver the lesson, and the suggested timing for each lesson component.

The materials include lesson overviews for each chapter. There is a "Pacing Guide" that includes timing for a lesson duration, 45–50 minutes, but does not include timing of individual lesson components.

Lesson overviews include the materials needed. For example, the Chapter 7 "Overview" consists of teacher materials needed from the "Teacher Resource Binder," the CD-ROM, and those sections of the student workbooks that are needed, such as "Student Workbook: TAKS Mid-Chapter RA." These materials were not provided for review.

1.3c – Materials include guidance on the effective use of lesson materials for extended practice (e.g., homework, extension, enrichment).

The materials include an "Instructional Approaches Guide" that provides guidance for various instructional approaches. For example, the Chapter 8 "Instructional Approaches Guide" includes guidance for hands-on activities, inquiry-based learning, and technology-integrated learning.

The materials contain an "Extension Workbook" that has extension activities for students. The materials do not include guidance for extended practice, such as homework, extension, or enrichment.

2. Progress Monitoring

Materials support educators in effective implementation through frequent, strategic opportunities to monitor and respond to student progress.

2.1 Instructional Assessments

GUIDANCE	SCORE SUMMARY	RAW SCORE
2.1a	The materials include a variety of summative and formative assessments that vary in types of tasks and questions. The materials do not include diagnostic assessments.	5/9
2.1b	The materials include the intended purpose for the types of instructional assessments. The materials do not include the definition of the types of instructional assessments.	1/2
2.1c	The materials do not include guidance to ensure consistent administration of instructional assessments or accurate administration of instructional assessments.	0/2
2.1d	The materials include formative and summative assessments. The materials do not include diagnostic assessments. The assessments are not aligned to the TEKS of the course.	0/6
2.1e	The materials include instructional assessments that are not of varying complexity, nor are they aligned to the TEKS.	0/2
—	TOTAL	6/21

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.

The materials include a variety of formative and summative instructional assessments at the unit and lesson level that vary in type of tasks and questions. Summative assessments examples from Chapter 4 include nine separate lab exercises with tasks that include research, filling in tables, graphing, and analyzing patterns, and an end-of-chapter test with questions that include analyzing word problems, data, basic solving, and writing equations with key features. Formative assessment examples from Chapter 3, Section 1, include various tasks such as creating a life-size Cartesian plane, posing questions, using software to plot points, and pairing students together by calling out coordinate plots.

The materials do not include diagnostic assessments that vary in types of tasks or questions.

The assessments at the unit level are only available in the *Teacher's Edition*.

2.1b – Materials include the definition and intended purpose for the types of instructional assessments included.

The materials include the intended purpose for types of instructional assessments included. For example, materials provide instructional approaches and differentiated instructions for each chapter. Each document includes the intended purpose for different learning styles and differentiation.

The materials do not include definitions for the types of instructional assessments.

2.1c – Materials include teacher guidance to ensure consistent and accurate administration of instructional assessments.

The materials provide inadequate guidance on consistent and accurate administration of assessments. For example, in Chapter 3, "Instructional Approaches" gives limited guidance on how students are to create a life-size Cartesian plane to walk on the floor by stating, "use string or rulers to measure and verify distances," with no other explanations of how to administer the activity.

The materials include assignment submission and scoring for assessments like quizzes, tests, labs, and exams, and instructions to take assignments on WebAssign. The materials identify where the assessments should be given within the chapter.

2.1d – Diagnostic, formative, and summative assessments are aligned to the TEKS and objectives of the course, unit, or lesson.

The materials include formative and summative assessments; however, there is no evidence of them being aligned to TEKS or objectives of the course, unit, or lesson.

The materials do not include diagnostic assessments.

2.1e – Instructional assessments include TEKS-aligned items at varying levels of complexity.

The materials include end-of-chapter assessments in the *Teacher's Edition*; however, they lack identification of TEKS alignment and varying levels of complexity.

2.2 Data Analysis and Progress Monitoring

GUIDANCE	SCORE SUMMARY	RAW SCORE
2.2a	The materials do not include instructional assessments and scoring information that provide guidance for interpreting student performance.	1/2
2.2b	The materials do not provide guidance for the use of included tasks and activities to respond to student trends in performance on assessments.	0/1
2.2c	All criteria for guidance met.	2/2
—	TOTAL	3/5

2.2a – Instructional assessments and scoring information provide guidance for interpreting student performance.

The materials provide scoring guidance for interpreting student performance. For example, the "Class Insights" feature summarizes class status, highlights questions students struggled with, and shows overall class performance. The materials do not provide specific guidance on how to interpret these insights in relation to student learning.

The materials do not include guidance for the use of the included activities to interpret student performance trends in assessment.

2.2b – Materials provide guidance for the use of included tasks and activities to respond to student trends in performance on assessments.

The materials include tasks and activities for performance assessments. For example, there are chapter tests and laboratory exercises that students complete at the end of each chapter to assess their learning.

The materials do not provide guidance for the use of included tasks and activities to respond to student trends in performance on assessments.

2.2c – Materials include tools for teachers to track student progress and growth, and tools for students to track their own progress and growth.

The materials include tools for teachers to track student progress and growth. For example, WebAssign includes a "Class Insights" dashboard that allows teachers to monitor assessment results, view class status, identify questions students struggled with, and assess overall class performance.

The materials include tools for students to track their own progress and growth. For example, WebAssign includes a "Class Insights" dashboard that allows students to monitor their performance over time.

3. Supports for All Learners

Materials support educators in reaching all learners through design focused on engagement, representation, and action/expression for learner variability.

3.1 Differentiation and Scaffolds

Guidance marked with a (T) refers to teacher-facing components. Guidance with an (S) refers to student-facing components.

GUIDANCE	SCORE SUMMARY	RAW SCORE
3.1a	The materials do not include scaffolding for students who have not yet reached proficiency on grade-level standards.	2/3
3.1b	The materials do not include preteaching or embedded supports for unfamiliar vocabulary and references in text (e.g., figurative language, idioms, academic language).	0/2
3.1c	The materials do not explicitly state that teacher guidance for differentiated instruction, enrichment, and extension activities is for students who have demonstrated proficiency in grade-level content and skills.	1/2
—	TOTAL	3/7

3.1a – Materials include teacher guidance for differentiated instruction, activities, and paired (scaffolded) lessons for students who have not yet reached proficiency on grade-level content and skills.

The materials include teacher guidance for differentiated instruction and activities for students who have not yet reached proficiency on grade-level content and skills. For example, in the *Teacher's Edition*, "Introduction: Differentiating Instruction to the Individual Needs of Students" includes general strategies and specific strategies for content, process, and product differentiation. For example, Chapter 8-1 includes the following: "Visual Organizers for Key Terms: Create a concept map for population, sample, and parameters to show relationships"; "Real Life Data Collection: Have students collect their own sample data by surveying classmates."

The materials include teacher guidance for differentiated activities for students who have not yet reached proficiency on grade-level content and skills. The "Cengage Teacher Guidance MMA Differentiated Instruction" document for Chapter 5 provides real-life simulations and project-based learning activities.

The materials include teacher guidance for paired lessons. For example, in Chapter 3, Lesson 2, the "Teacher Guidance: Differentiated Instruction" includes scaffolded instructions for graphing linear equations. It states, "Beginner: Identify x- and y-intercepts from a graph. Intermediate: Create a table of values to graph a line."

The materials include a chapter reviewing algebra content and an additional chapter with extra practice on prerequisite skills needed for success in the course. However, these resources are not paired with specific lessons to support students who have not yet reached proficiency in grade-level content and skills.

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)

The materials include a document titled "Parent Letter: Emergent Bilingual Students," which provides vocabulary support for each chapter. However, these resources are not embedded in the student or teacher texts and are not referenced within the lessons. For example, the Chapter 8 letter states, "The following Chapter 8 vocabulary terms are homophones (words that sound the same but have different meanings) or words with multiple meanings," and lists terms with their mathematical definitions alongside example sentences using the non-mathematical meanings.

The materials do not include preteaching or embedded supports for unfamiliar vocabulary or references in text.

3.1c – Materials include teacher guidance for differentiated instruction, enrichment, and extension activities for students who have demonstrated proficiency in grade-level content and skill.

The materials include teacher guidance for differentiated instruction for students who have demonstrated proficiency in grade-level content and skills. For example, the "Teacher Guidance Differentiated Instruction Introduction" document states the following about differentiation: "for high-achieving students, it can challenge and engage them to achieve a more complex understanding of advanced mathematics."

The materials include enrichment and extension activities through lab exercises but do not explicitly state that they are for students who have demonstrated proficiency in grade-level content and skills. The beginning of each suggested laboratory exercise at the end of each unit states, "The following are some problems that are food for group discussion and collaborative work."

3.2 Instructional Methods

GUIDANCE	SCORE SUMMARY	RAW SCORE
3.2a	The materials do not include explicit (direct) prompts and guidance to support the teacher in modeling and explaining the concept(s) to be learned.	0/4
3.2b	All criteria for guidance met.	2/2
3.2c	The materials do not support multiple types of practice (e.g., guided, independent, collaborative) and do not include guidance for teachers and recommended structures (e.g., whole group, small group, individual) to support effective implementation.	0/3
—	TOTAL	2/9

3.2a – Materials include explicit (direct) prompts and guidance to support the teacher in modeling and explaining the concept(s) to be learned.

The material includes a brief overview of the concepts to be learned in the scope and sequence but does not include explicit prompts or guidance to support the teacher in modeling and explaining the concepts to be learned.

3.2b – Materials include teacher guidance and recommendations for effective lesson delivery and facilitation using a variety of instructional approaches.

The materials provide limited teacher guidance and recommendations for effective lesson delivery and facilitation using a variety of instructional approaches. In the *Teacher's Edition*, the "Teacher Guidance: Instructional Approaches" includes a list of multiple instructional approaches; however, the guidance is limited and consists of basic instructions. For example, in Chapter 8, Section 8-1 includes "Hands-On" and "Experiential Learning" guidance, and it states, "Have students collect their own survey data and classify it as qualitative or quantitative."

There are a variety of approaches, but there is no teacher guidance and recommendations for effective lesson delivery or facilitation. The materials provide only student-facing materials and do not provide educator guidance for effectively delivering lessons.

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.

The *Teacher's Edition* includes a variety of practice types in each chapter, such as guided practice, independent practice, calculator mini-lessons, math labs, and extension workbooks, but does not provide

guidance to support effective implementation. The materials do not guide teachers in using different structures of instruction, such as independent or small-group instruction formats.

The materials include only two types of practice to support effective implementation. The *Teacher's Edition* includes a standard practice at the end of each section and labs at the end of each unit. While the materials offer online resources for creating assignments, the available questions are not specific to the *Mathematical Models* course.

The materials do not include guidance for teachers to support effective implementation of practices and labs.

The materials do not include recommended structures to support effective implementation.

3.3 Support for Emergent Bilingual Students

An emergent bilingual student is a student who is in the process of acquiring English and has another language as the primary language. The term emergent bilingual student replaced the term English learner in the Texas Education Code 29, Subchapter B after the September 1, 2021 update. Some instructional materials still use English language learner or English learner and these terms have been retained in direct quotations and titles.

GUIDANCE	SCORE SUMMARY	RAW SCORE
3.3a	The materials do not 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 academic language.	0/2
3.3b	The materials do not include implementation guidance to support teachers in effectively using the materials in state-approved bilingual/ESL programs.	0/1
3.3c	The materials do not 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.	0/8
3.3d	This guidance is not applicable to the program.	N/A
—	TOTAL	0/11

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.

The materials do not include teacher guidance on providing linguistic accommodations for various levels of language proficiency. The materials provide limited guidance on strategies for teaching emergent bilingual (EB) students. For example, the "Support for Emergent Bilingual Students" contains documents for each chapter. The Chapter 4 document includes guidance for teachers to "use real world examples to introduce functions," "provide guided practice in identifying domain and range," and "use color-coded graphs." However, this guidance does not provide linguistic support.

The "Support for Multilingual Families" provides linguistic support for guardians through chapter-based letters. Each letter highlights key terms for the chapter and includes examples to explain their meaning. For example, the letter for Chapter 1 states, "Rate has multiple meanings, including speed or evaluation. 'The car traveled at a fast rate.' 'She rated the movie five stars.'" These letters do not provide guidance for teachers.

3.3b – Materials include implementation guidance to support teachers in effectively using the materials in state-approved bilingual/ESL programs.

The materials include documents that outline guidance for all levels of EB students and activities and supports for specific sections of different products. Each page in the document lists the text with which the activity goes; however, those texts are *Precalculus with Limits* and *Algebraic Modeling*. None of the pages references *Mathematical Models with Applications*.

The materials do not include implementation guidance to support teachers in effectively using the materials in state-approved bilingual/English as a second language (ESL) programs.

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.

The materials provide linguistic support for guardians through chapter-based letters found in the supplemental resource titled "Support for Multilingual Families." Each letter includes key vocabulary terms from the chapter and provides examples to explain their meaning. For example, in Chapter 1, the letter states, "Rate has multiple meanings, including speed or evaluation. 'The car traveled at a fast rate.' 'She rated the movie five stars.'" While these resources support family understanding, they are not intended to serve as instructional guidance for teachers.

The materials do not include evidence of 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.

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.

This guidance is not applicable because the program is not designed for dual language immersion (DLI) programs.

4. Depth and Coherence of Key Concepts

Materials are designed to meet the rigor of the standards while connecting concepts within and across grade levels/courses.

4.1 Depth of Key Concepts

GUIDANCE	SCORE SUMMARY	RAW SCORE
4.1a	The materials do not include practice opportunities aligned to the TEKS.	1/2
4.1b	All criteria for guidance met.	1/1
—	TOTAL	2/3

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.

The materials include instructional assessments at the end of units that require students to demonstrate depth of understanding. For example, the end of Chapter 4 includes labs for students to extend their learning. One such lab has students research local pizza sizes and prices to determine who has the best sales.

The materials include practice opportunities over the course and at the end of lessons that demonstrate depth of understanding, but there is no indication of TEKS alignment.

4.1b – Questions and tasks progressively increase in rigor and complexity, leading to grade-level proficiency in the mathematics TEKS.

The materials include questions and tasks that progressively increase in rigor and complexity over the course of a unit. For example, Chapter 5 begins with basic sales tax calculations and ends with budgeting real-world expenses.

The materials include questions and tasks that increase in rigor and complexity. For example, Lesson 10, Session 1 starts with solutions and equations and moves to solving real-world problems. Alignment to the TEKS was not found.

4.2 Coherence of Key Concepts

GUIDANCE	SCORE SUMMARY	RAW SCORE
4.2a	The materials do not demonstrate coherence across units by explicitly connecting patterns, big ideas, and relationships among mathematical concepts.	0/1
4.2b	The materials do not 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.	0/3
4.2c	The materials do not 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.	0/4
—	TOTAL	0/8

4.2a – Materials demonstrate coherence across units by explicitly connecting patterns, big ideas, and relationships between mathematical concepts.

The materials include an introductory unit that previews concepts that will be presented in the book. For example, the *Teacher's Edition* contains chapter summaries for each chapter. The Chapter R summary states, "Students should be familiar with these topics because these skills will be necessary for success in subsequent chapters."

The materials do not demonstrate coherence across units by explicitly connecting patterns, big ideas, and relationships between mathematical concepts.

4.2b – 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 materials include chapter summaries with vocabulary found within the chapter. For example, the Chapter 1 summary in the *Teacher's Edition* defines mathematical modeling as "The process of examining a given situation or real-world problem and then developing an equation, formula, table, or graph that correctly represents the main features of the situation." It goes on to state, "As you work through this book, you will have many chances to construct your own mathematical models and then work with them to solve problems, make predictions, and carry out any number of other tasks."

The materials do not 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.

4.2c – 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.

The materials include a brief connecting sentence that explains a concept learned in a previous chapter. For example, Section 6-1 states, "In Chapter 2, you learned to graph a linear equation using both a table of ordered-pair solutions and the slope-intercept form ($y = mx + b$) of the equation. We can use either of these techniques to graph each of the equations in the system."

The materials do not 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.

4.3 Coherence and Variety of Practice

GUIDANCE	SCORE SUMMARY	RAW SCORE
4.3a	The materials do not provide spaced retrieval opportunities with previously learned skills across units and skills and concepts across lessons and units.	1/4
4.3b	The materials do not provide interleaved practice opportunities with previously learned skills and concepts across learning pathways but do include interleaved practice.	1/4
—	TOTAL	2/8

4.3a – Materials provide spaced retrieval opportunities with previously learned skills and concepts across lessons and units.

The materials provide a spaced practice strategies explanation page for each chapter, which explains the spaced practice for each section of the chapter. For example, the "Spaced and Interleaved Practice Strategies" for Chapter 4 state, "By implementing spaced and interleaved practice, teachers can help students deepen their understanding and improve long-term retention of function concepts. Continual review and mixed practice will strengthen problem-solving skills and confidence in the mathematical applications of functions."

The materials provide information for student lessons with spaced practice, but these do not include learned skills or concepts across units. For example, in the "Spaced and Interleaved Practice Strategies" for Chapter 4, Section 4-1, "Functions" states, "Spaced Practice: Introduce definitions and notation first, then revisit them when analyzing graphs and tables."

4.3b – Materials provide interleaved practice opportunities with previously learned skills and concepts across lessons and units.

The materials provide an interleaved practice strategies explanation page for each chapter, which explains the interleaved practice for each section of the chapter. For example, the "Spaced and Interleaved Practice Strategies" for Chapter 4 state, "By implementing spaced and interleaved practice, teachers can help students deepen their understanding and improve long-term retention of function concepts. Continual review and mixed practice will strengthen problem-solving skills and confidence in the mathematical applications of functions."

The materials provide information for student lessons with interleaved practice, but these do not include learned skills or concepts across learning pathways. For example, in the "Spaced and Interleaved Practice Strategies" for Chapter 4, Section 4-1, "Functions," states, "Interleaved Practice: Mix function identification with domain and range problems across multiple problem sets."

5. Balance of Conceptual and Procedural Understanding

Materials are designed to balance conceptual understanding, procedural skills, and fluency.

5.1 Development of Conceptual Understanding

GUIDANCE	SCORE SUMMARY	RAW SCORE
5.1a	All criteria for guidance met.	3/3
5.1b	All criteria for guidance met.	1/1
5.1c	All criteria for guidance met.	1/1
—	TOTAL	5/5

5.1a – Questions and tasks require students to interpret, analyze, and evaluate models and representations for mathematical concepts and situations.

The materials allow for questions and tasks to build upon prior knowledge to interpret models and representations in real-world applications. For example, in Chapter 5, "Suggested Laboratory Activities," four students are given a diagram of the sample apartment to furnish with furniture. Students are asked to research furniture stores to 'purchase' furniture for the entire apartment. Using the online store's pricing and financing plans, students must interpret the financing costs for various scenarios, such as zero interest or not paying off the loan within the promotional period. In Chapter 6, Section 3, Example 5, students are provided a model in which they are to analyze and evaluate mathematical applications of linear systems.

The materials provide questions and tasks that require students to analyze models and representations of mathematical concepts and situations. For example, Chapter 8, Section 1, practice questions require students to analyze misleading pictographs in statistics and research other misleading pictographs.

The materials include questions and tasks for students to interpret and evaluate models. For example, the Section 8-2 practice requires students to interpret a line graph from the stock market over a five-day period and different aspects of the model. Students must also evaluate a dot plot model of television sets owned by families and then evaluate, based on the model, how many families were surveyed.

5.1b – Questions and tasks require students to create models to represent mathematical situations.

The materials include questions that require students to create models to represent mathematical situations. For example, the Section 8-3 practice includes questions that require students to create frequency charts and histograms, given data from real-world situations.

The materials include tasks that require students to create models to represent mathematical situations. For example, in Chapter 2, "Applications of Algebraic Modeling," there are examples and questions related to real-world applications, such as "A builder is completing the flooring in the living room shown

in the drawing. He needs to purchase an adequate amount of baseboard molding and enough carpet to cover the floor. The openings for the two doors are 3 ft wide. Calculate the number of feet of molding he must purchase. Then calculate the number of square yards of carpet needed to complete the job. (Remember: 1 yd = 3 ft, so 1 yd² = 9 ft²)."

5.1c – Questions and tasks provide opportunities for students to apply conceptual understanding to new problem situations and contexts.

The materials include questions that provide opportunities for students to apply conceptual understanding to new problem situations and contexts. For example, in Chapter 3, the materials provide instruction on calculating slope from a table or graph and subsequently making predictions from graphs. The practice problem sets in Section 3-5 include questions in which students have to apply the concept of calculating slope and making predictions based on the data in real-world scenarios. Questions in this section include a table of values and require students to complete multiple steps, such as "An electrical circuit has a variable voltage source, and as the voltage (volts, V) in the circuit increases, so does the current (milliamps, mA) flowing in the circuit. The table below gives voltages and the corresponding currents, based on direct measurements of the circuit. volts (a) Plot a graph of this data with voltage on the x-axis. (b) Write the equation of the resultant line. (c) What current would flow if a voltage of 3.0 V was supplied to this circuit? (d) Approximately what voltage would be necessary to produce a current of 25 mA? (e) If the voltage doubles in this circuit, what happens to the current?"

The materials include tasks that provide opportunities for students to apply conceptual understanding to new problem situations and contexts. For example, in the Section 8 "Suggested Laboratory Exercises," students are required to create a regression model to predict the number of Target stores in the future based on previous data.

5.2 Development of Fluency

GUIDANCE	SCORE SUMMARY	RAW SCORE
5.2a	All criteria for guidance met.	2/2
5.2b	The materials do not include opportunities for error analysis or address common misconceptions within instruction or practice.	2/3
5.2c	The materials do not provide opportunities for students to evaluate procedures, processes, and solutions for efficiency, flexibility, and accuracy within the lesson and throughout a unit.	0/3
5.2d	The materials do not contain embedded supports for teachers to guide students toward increasingly efficient approaches.	0/1
—	TOTAL	4/9

5.2a – Materials provide tasks that are designed to build student automaticity and fluency necessary to complete grade-level tasks.

The materials provide tasks that are designed to build student automaticity and fluency necessary to complete grade-level tasks. Each lesson has multiple questions over the same content. For example, in the "Student Workbook," Chapter 3, Practice Set 3-1 includes 12 questions on plotting points, eight questions on identifying points from a graph, nine questions on naming points on the graph given the description, and 10 questions using a table to find ordered-pair solutions for given equations.

The materials provide a clear timeline and consistent layout of the material to build the automaticity and fluency necessary to complete grade-level tasks. Within each chapter in the *Teacher's Edition*, the materials provide several opportunities: guided practice, independent practice, calculator mini-lessons, math labs, and extension workbooks to build automaticity and fluency necessary to complete grade-level tasks.

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.

The materials provide opportunities for students to practice the application of efficient, flexible, and accurate procedures throughout a unit. For example, in the "Student Workbook" in Chapter 6, Session 6-2, students practice multiple methods for solving systems of equations and then respond to questions with the instructions "Solve the following using any method," giving students the opportunity to decide which method to use. In problems with multiple methods of solving, the materials do not prompt students to evaluate or determine which method is most efficient.

The materials provide multiple opportunities for students to use the various strategies for solving problems, allowing for flexibility or exploring alternative strategies. Mathematical procedures are introduced, revisited, or connected throughout learning pathways. For example, in the *Teacher's Edition*,

Chapter 3 is about graphing and proceeds as follows: Rectangular Coordinate System, Graphing Linear Equations, Slope, Writing Equations of Lines, and Applications and Uses of Graphs. The culminating laboratory exercises include all of these.

The materials within the "Student Workbook" provide opportunities for students to apply procedures efficiently and flexibly. The materials support the development of prerequisite and foundational skills while also offering enrichment to extend learning, such as the laboratory exercises at the end of each chapter in the "Student Workbook."

The materials do not include opportunities for error analysis or address common misconceptions within instruction or practice.

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.

The materials provide students with the opportunity to solve problems using "any method we have studied," as stated in the "Student Workbook," Chapter 6, Practice Set 6–3, but they do not give students the opportunity to justify or explain their choice of method.

The materials do not provide opportunities for students to evaluate the efficiency, flexibility, or accuracy of procedures across a unit.

The materials do not include activities that require students to analyze mathematical procedures or solutions for efficiency, flexibility, or accuracy. Students are not provided opportunities to evaluate procedures, processes, or solutions as part of their learning.

5.2d – Materials contain embedded supports for teachers to guide students toward increasingly efficient approaches.

The materials do not contain embedded supports to help teachers guide students toward increasingly efficient approaches. For example, the student and teacher editions are identical and do not include additional instructional guidance or scaffolds for the teacher.

The materials do not include instructional guidance or explanations of efficient approaches.

5.3 Balance of Conceptual Understanding and Procedural Fluency

GUIDANCE	SCORE SUMMARY	RAW SCORE
5.3a	The materials do not explicitly state how the conceptual and procedural emphases of the TEKS are addressed.	0/2
5.3b	All criteria for guidance met.	3/3
5.3c	The materials include supports for students in connecting, creating, concrete and representational models to abstract (symbolic/numeric/algorithmic) concepts, as required by the TEKS. The materials do not include supports for students in defining and explaining concrete and representational models to abstract (symbolic/numeric/algorithmic) concepts, as required by the TEKS.	4/6
—	TOTAL	7/11

5.3a – Materials explicitly state how the conceptual and procedural emphasis of the TEKS are addressed.

The materials provide a planning guide with the TEKS for each section within every chapter but do not explicitly state how conceptual and procedural emphasis of the TEKS is addressed.

The materials include a separate document that outlines the TEKS correlations but states that they are pending TEA Approval. The document includes hyperlinks to each section of the textbook that correlates with the named TEKS.

5.3b – Questions and tasks include the use of concrete models and manipulatives, pictorial representations (figures/drawings), and abstract representations, as required by the TEKS.

The material has questions and tasks that include the use of concrete models and manipulatives, pictorial representations, and abstract representations, as required by the TEKS. For example, in the *Teacher's Edition*, the Chapter 2 review problems include questions using models, pictures of windows, and blueprints of a building, which are all required in TEKS 6.A.

The materials contain lab exercises that require students to create manipulatives to answer questions and collect data. For example, in the *Teacher's Edition*, Chapter 8 Lab, Exercise 10 requires students to create a simple pendulum and collect data with their models. The materials also have the students complete labs and calculator mini-lessons that use concrete models, manipulatives, and abstract representations.

5.3c – Materials include supports for students in connecting, creating, defining, and explaining concrete and representational models to abstract (symbolic/numeric/algorithmic) concepts, as required by the TEKS.

The materials include supports for students in connecting concrete and representational models to abstract concepts. For example, in the *Teacher's Edition*, Chapter 2, Section 4, Example 8 has students transform sine waves and then shows how the waves can be found in pottery and paintings.

The materials provide students support in creating concrete and representational models to abstract concepts. For example, in the *Teacher's Edition*, Chapter 2, Lab Exercise 11 provides students the opportunity to analyze a sculpture using scale models, sketch the sculpture, and apply the scale models to determine measurements of their drawings.

The materials do not include supports for students to define and explain concrete and representational models to abstract concepts as required by the TEKS.

5.4 Development of Academic Mathematical Language

GUIDANCE	SCORE SUMMARY	RAW SCORE
5.4a	The materials do not provide opportunities for students to develop academic mathematical language using manipulatives.	2/3
5.4b	The materials do not include embedded educator guidance to scaffold, support, and extend students' use of academic mathematical vocabulary in context when communicating with peers and educators.	0/1
5.4c	The materials do not include embedded teacher guidance 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 exemplary responses to questions and tasks.	0/6
—	TOTAL	2/10

5.4a – Materials provide opportunities for students to develop academic mathematical language using visuals, manipulatives, and other language development strategies.

The materials provide opportunities for students to develop academic mathematical language using visuals, manipulatives, or other language development strategies, such as vocabulary definitions throughout each lesson, and explains key terms using different techniques. For example, in the *Teacher's Edition*, Section 3-3, students are learning about slope. The text begins with the definition, followed by a real-world example, using simpler words, such as "rise (up or down) and the run (right or left)." The text then proceeds to show graphs demonstrating slope and how to find it.

The materials do not provide opportunities for students to develop their academic language using manipulatives.

The materials provide vocabulary with detailed definitions and visuals. Every chapter comes with a chapter and page guide in the pace and sequence.

The material provides step-by-step instruction to apply vocabulary definitions on a TI-83 Plus or TI-84 graphing calculator.

5.4b – Materials include embedded teacher guidance to scaffold and support students' development and use of academic mathematical vocabulary in context.

The materials include embedded teacher guidance to scaffold lessons. The scaffolding is not explicitly directed to support students' development and use of academic mathematical vocabulary in context. For example, in the "Online Digital Materials," Chapter 3, "Instructional Approaches" includes four

approaches for the slope section, such as "Hands-On and Experimental Learning," "Problem-Based Learning," "Visual and Graphical Approaches," and "Technology-Integrated Learning." None of the approaches include opportunities to engage in mathematical discourse or intentionally use academic vocabulary.

The "Online Digital Resources" include a handout titled "Support for Bilingual Students." The handout includes support for Chapter 1, Section 1, which states, "Define mathematical models in simple terms and relate them to familiar real-world examples." The materials do not include embedded teacher guidance to support students' development and use of academic vocabulary in context.

5.4c – Materials include embedded teacher guidance 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.

The materials include bolded mathematical vocabulary words that are important to the chapter embedded with definitions in each chapter's explanation section. For example, in the *Teacher's Edition*, Chapter 6, Section 1, the materials state, "In algebra, the set of numbers commonly encountered in solving various equations and formulas and in graphing is called the real numbers."

The materials do not provide opportunities for students to hear, refine, and use math language with peers and develop their math language toolkit over time and do not guide teachers to support student responses using exemplary responses to questions and tasks.

The materials do not include embedded teacher guidance to support mathematical conversations.

The materials do not include embedded teacher guidance to support student responses using exemplar responses to questions and tasks.

5.5 Process Standards Connection

GUIDANCE	SCORE SUMMARY	RAW SCORE
5.5a	All criteria for guidance met.	1/1
5.5b	The materials do not include a description of how TEKS process standards are incorporated and connected throughout the course.	0/2
5.5c	The materials do not include a description for each unit of how TEKS process standards are incorporated and connected throughout the unit.	0/2
5.5d	The materials do not include an overview of the TEKS process standards incorporated into each lesson.	0/1
—	TOTAL	1/6

5.5a – TEKS process standards are integrated appropriately into the materials.

The TEKS process standards are integrated appropriately throughout the material. For example, in the *Teacher's Edition*, Chapter 8, Lab Exercise 4, the students are instructed to predict growth for a retail store chain. In this activity, students use data to create a prediction model to analyze and create a conclusion based on their findings.

The materials include an alignment of the TEKS in the scope and sequence. They properly integrate the process standards into the guided practice and labs. The materials have guided practice, graphing calculator lessons, and labs that properly integrate the process standards.

5.5b – Materials include a description of how TEKS process standards are incorporated and connected throughout the course.

The materials include a "Teacher Planning Guide" in the "Online Digital Resources." The planning guide includes a TEKS alignment chart for each chapter. For example, the guide states that Chapter 1, Section 2, "Formulas," correlates to MMA TEKS 1A, 1C1, 1D, and 2A.

The materials do not include a description of how TEKS process standards are incorporated and connected throughout the course.

5.5c – Materials include a description for each unit of how TEKS process standards are incorporated and connected throughout the unit.

The materials include a "Teacher Planning Guide" available in the "Online Digital Resources." The guide includes a TEKS alignment chart for each chapter. For example, the guide states that Chapter 1, Section 1, "Mathematical Models," correlates to MMA TEKS 1A, 1F, and 9C.

The materials do not include a description of how TEKS process standards are incorporated and connected throughout the units.

5.5d – Materials include an overview of the TEKS process standards incorporated into each lesson.

The materials include a "Teacher Planning Guide" in the "Online Digital Resources." The guide includes a TEKS alignment chart for each chapter. For example, the guide states that Chapter 1, Section 3, "Ratio and Proportion," correlates to MMA TEKS 6C.

The materials do not include a description of how TEKS process standards are incorporated and connected throughout the lessons.

6. Productive Struggle

Materials support students in applying disciplinary practices to productive problem-solving, including explaining and revising their thinking.

6.1 Student Self-Efficacy

GUIDANCE	SCORE SUMMARY	RAW SCORE
6.1a	All criteria for guidance met.	3/3
6.1b	The materials do not support students in understanding, explaining, and justifying that there can be multiple ways to represent and solve problems and complete tasks.	0/6
6.1c	The materials are not designed to require students to make sense of mathematics through multiple opportunities for students to do, write about, and discuss mathematics with peers and teachers.	0/3
—	TOTAL	3/12

6.1a – 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 think mathematically and persevere through solving problems. For example, in the *Teacher's Edition*, the Section 4-5 "Practice" includes a question requiring students to decide if a set of data is linear and explain how they made the decision. If they decided it was linear, students are asked, "Are all of the slopes the same? If they are not exactly equal then explain why," which allows students to think through the problem and keep progressing through scaffolded questions.

The materials provide students the opportunity to make sense of mathematics by asking them open-ended questions explaining expressions, equations, and problems. For example, in the *Teacher's Edition*, the Chapter 1 "Test Review" contains a question that states, "Explain why the following simplification is incorrect. Then simplify the initial expression."

The materials provide aligned practice, mathematical labs, and enrichment workbooks that provide opportunities to think mathematically, persevere, and make sense of the problems. For example, each chapter concludes with a "Lab Exercise" that includes group discussion and collaborative tasks. These labs provide opportunities for students to compare data and engage with real-world mathematical contexts. In the *Teacher's Edition*, Chapter R, "Lab Exercise 3: Our Growing Population," students are directed to navigate www.census.gov to explore population data. They then make connections by responding to a series of open-ended questions that promote analysis and interpretation of authentic data sources.

6.1b – Materials support students in understanding, explaining, and justifying that there can be multiple ways to represent and solve problems and complete tasks.

The materials do not support students in understanding, explaining, and justifying that there can be multiple ways to represent and solve problems and complete tasks.

The materials state the word "understand" nine times in the explanation of the topics but never guide students through their thinking.

The materials ask students to explain but never address multiple ways to solve a problem.

6.1c – Materials are designed to require students to make sense of mathematics through multiple opportunities for students to do, write about, and discuss math with peers and teachers.

The materials provide opportunities for students to do and discuss math with peers. For example, in the *Teacher's Edition*, Chapter 2 Review, Problem 25 asks students to "discuss with your group members the similarities and differences between two graphs." However, the materials do not provide opportunities for students to do and discuss math with teachers.

The materials do not provide opportunities for students to write about math with peers and teachers.

6.2 Facilitating Productive Struggle

GUIDANCE	SCORE SUMMARY	RAW SCORE
6.2a	The materials do not support teachers in guiding students to share and reflect on their problem-solving approaches, including explanations, arguments, and justifications.	0/6
6.2b	The materials do not offer prompts and guidance to support teachers in providing explanatory feedback based on student responses and anticipated misconceptions.	0/4
—	TOTAL	0/10

6.2a – Materials support teachers in guiding students to share and reflect on their problem-solving approaches, including explanations, arguments, and justifications.

The materials do not support teachers in guiding students to share their problem-solving process, including explanations, arguments, and justifications.

The materials do not support teachers in guiding students to reflect on their problem-solving process, including explanations, arguments, and justifications.

6.2b – Materials include prompts and guidance to support teachers in providing explanatory feedback based on student responses and anticipated misconceptions.

The materials do not offer prompts to support teachers in providing feedback based on student responses and anticipated misconceptions.

The materials do not offer guidance to support teachers in providing feedback based on student responses and anticipated misconceptions.