magma

ALIGNMENT GUIDE

Grade 5

What this document covers

Part 1 ELPS Integration
Part 2 Course-Level Design and Horizontal Alignment
Part 3 Vertical Alignment and Learning Progressions
Part 4 Coherence and Concept Depth
Part 5 Types of Content and Representations
Part 6 Process Standards Integration

Part 1: ELPS Integration

Magma Math is designed to support emergent bilingual (EB) students across all four ELPS language domains: listening, speaking, reading, and writing. The platform includes built-in features that reduce linguistic barriers while maintaining rigorous, grade-level mathematical content. The features described below are available across all grade levels and learning pathways.

Multilingual Translation and Text-to-Speech

Magma Math provides high-quality translation of all student-facing content, including problem text and instructions, into over 140 languages. This translation is paired with a text-to-speech feature that reads content aloud while highlighting each word in real time as it is spoken. This dual modality directly supports multiple ELPS expectations:

ELPS (1)(B), Listening. Students can hear content-specific mathematical vocabulary pronounced accurately in English or their home language, supporting comprehension of grade-level terms during both formal and informal interactions with the platform.

ELPS (1)(F), Listening. The text-to-speech feature functions as an auditory multimedia source from which students derive meaning to build and reinforce both mathematical concepts and language acquisition. The word-by-word highlighting synchronizes visual and auditory input, reinforcing the connection between written and spoken forms of academic language.

ELPS (3)(C), Reading. By providing translated content alongside the original English, students can leverage contextual factors and cognates to comprehend content-area vocabulary in text. A student encountering a word problem can toggle to their home language to confirm understanding of context before solving in the mathematical register.

ELPS (3)(F), Reading. Students derive meaning from content-area texts using visual, contextual, and linguistic supports. Magma Math's translated text serves as linguistic support, while the platform's visual problem representations (bar models, fraction bars, number lines, base-ten blocks, hundred grids, area models, coordinate planes, bar graphs, line plots, scatterplots, unit cube constructions, input-output tables, and conversion reference tables) provide language-independent visual support.

Visual and Multimodal Problem Representations

Across all learning pathways, Magma Math presents problems using visual models that communicate mathematical relationships without relying solely on text. These include bar models, fraction bars, number lines, base-ten blocks, hundred grids, area models, coordinate planes, bar graphs, line plots, scatterplots, unit cube constructions, input-output tables, and conversion reference tables. These representations support:

ELPS (4)(C), Writing. Students write responses using a combination of high-frequency words and content-area vocabulary as they interact with problems that pair visual models with mathematical notation. The visual context scaffolds written mathematical expression.

ELPS (2)(E), Speaking. When teachers use Magma Math problems as anchors for classroom discussion, the visual representations provide EB students with concrete referents for narrating, describing, explaining, and justifying their mathematical reasoning with increasing specificity and detail.

Part 2: Grade-Level Design and Horizontal Alignment

Program Context

Magma Math is a TEKS-aligned digital supplemental resource (19 TAC §111.25). Content is organized into learning pathways that function like chapters in a traditional curriculum. Each pathway bundles related TEKS and key concepts so teachers can assign coherent sets of problems, even though Magma does not prescribe a day-by-day lesson sequence.

Rationale for Grade 5 Learning Paths

The Grade 5 scope and sequence is organized into three Instructional Strands designed to build conceptual understanding before application. The strands connect patterns, big ideas, and relationships within the grade so that students see later topics as extensions of earlier ones rather than isolated skills. Mathematics at this grade level tells a continuous, connected story in which TEKS within the same strand in a specific grade level relate to the same big idea, while TEKS across strands can also connect in a variety of ways.

Strand 1: Number Sense and Foundational Operations (Chapters 1-4)

Grade 5 opens by deepening students' understanding of the decimal number system. Chapter 1 (Understanding Decimals) extends Grade 4 work with decimals through hundredths to reading, writing, comparing, and rounding decimals through thousandths, reinforcing the base-ten structure of the number system (TEKS 5.2.A-C). Chapters 2 and 3 (Operations on Whole Numbers and Operations on Decimals) then develop fluency with multi-digit multiplication and division and extend arithmetic to decimal operations, including multiplying decimals to hundredths and dividing decimals by whole numbers (TEKS 5.3.A-G, 5.3.K). Chapter 4 (Operations on Fractions) builds directly on the decimal and whole-number fluency from the earlier chapters, requiring students to add and subtract fractions with unlike denominators and to multiply and divide with unit fractions (TEKS 5.3.H-L). This strand ensures students develop a unified understanding of operations across whole numbers, decimals, and fractions before applying those skills in more complex contexts.

Strand 2: Algebraic Reasoning and Patterns (Chapters 5-6)

Once operational fluency is established, the focus shifts to algebraic thinking. Chapter 5 (Expressions, Equations, and Patterns) asks students to evaluate variable expressions involving decimals, represent word problems as equations with unknowns, generate and describe numerical patterns, and apply order of operations with grouping symbols (TEKS 5.4.B, C, E, F). Chapter 6 (Perimeter and Area) extends the operations from Strand 1 into measurement formulas, requiring students to apply multiplication and decimal operations to compute perimeters and areas of rectangles, parallelograms, and composite rectilinear figures (TEKS 5.4.H). For example, area tasks in Chapter 6 assume the multiplication fluency built in Chapters 2-3, so students can focus their cognitive energy on understanding geometric relationships rather than basic computation.

Strand 3: Geometry, Measurement, and Data (Chapters 7-11)

The final strand applies the number sense and algebraic reasoning from Strands 1 and 2 to spatial, measurement, and data contexts. Chapter 7 (2D Figures) develops classification of polygons and quadrilaterals (TEKS 5.5.A). Chapter 8 (Volume) introduces three-dimensional measurement using unit cubes and the formula for volume of rectangular prisms, connecting multiplication and area concepts to a new dimension (TEKS 5.4.G-H, 5.6.A-B). Chapter 9 (Converting Units) requires students to apply decimal operations within customary and metric conversions (TEKS 5.7.A). Chapter 10 (Coordinate Systems) formalizes ordered pairs and graphing in the first quadrant (TEKS 5.8.A-C), and Chapter 11 (Data Analysis) uses all prior number work to represent and interpret data through bar graphs, line plots with fractions, scatterplots, and frequency tables (TEKS 5.9.A-C). Volume tasks in Chapter 8 assume multiplication fluency from Strand 1, and data problems in Chapter 11 draw on fraction and decimal understanding from Chapters 1, 3, and 4.

Grade 5 Scope and Sequence

Seq	Chapter (Learning Pathway)	Subchapters	Focus TEKS
1	Understanding decimals (5.2.A-C)	Reading and writing decimals • Comparing decimals to hundredths • Comparing decimals to thousandths • Rounding to the tenths • Rounding to the hundredths	5.2.A, 5.2.B, 5.2.C
2	Operations on whole numbers (5.3.A-C, E-F, H, 5.4.A)	Estimate sums, differences, products, and quotients • Multiplying 2-digit and 3-digit numbers • Dividing up to 4-digit by 1- and 2-digit numbers • Division by multiples of 10 • Prime and composite numbers	5.3.A, 5.3.B, 5.3.C, 5.4.A
3	Operations on decimals (5.3.D-G, 5.3.K)	Adding and subtracting decimals • Multiplying decimals by whole numbers • Multiplying decimals to hundredths • Dividing decimals by whole numbers • Complex money word problems • Adding and subtracting positive rational numbers	5.3.D, 5.3.E, 5.3.F, 5.3.G, 5.3.K
4	Operations on fractions (5.3.H-L)	Adding and subtracting fractions • Adding fractions with denominators 10 and 100 • Multiplying fractions by whole numbers • Dividing unit fractions by whole numbers • Dividing whole numbers by unit fractions	5.3.H, 5.3.I, 5.3.J, 5.3.K, 5.3.L

5	Expressions, equations, and patterns (5.4.B, C, E, F)	Evaluate variable expressions with decimals • Word problems as equations with unknown • Numerical patterns as input-output tables and rules • Describe meaning of parentheses and brackets • Order of operations with grouping symbols	5.4.B, 5.4.C, 5.4.E, 5.4.F
6	Perimeter and area (5.4.H)	Area of rectangles • Area and perimeter of rectangles • Area of parallelogram • Area of rectilinear figures • Perimeter of polygons	5.4.H
7	2D figures (5.5)	Polygons • Quadrilaterals	5.5.A
8	Volume (5.4.G-H, 5.6.A-B)	Volume using unit cubes • Volume of right rectangular prisms	5.4.G, 5.4.H, 5.6.A, 5.6.B
9	Converting units (5.7.A)	Converting length, volume, and weight in both customary and metric systems (with decimals)	5.7.A
10	Coordinate systems (5.8.A-C)	Intro to coordinate systems • Plotting points with positive coordinates	5.8.A, 5.8.B, 5.8.C
11	Data Analysis (5.9.A-C)	Bar graphs • Line plots • Line plots with fractions • Stem and leaf plots • Tables and frequency tables • Scatterplots • Solving problems with data representations	5.9.A, 5.9.B, 5.9.C

[Screenshot placeholder: Magma Math platform showing the Grade 5 Texas book with the chapter and subchapter structure visible in the teacher assignment view.]

Part 3: Vertical Alignment (K-6 Learning Progressions)

Vertical Rationale

Magma Math is built on a coherent progression where concepts spiral in complexity across grades. TEKS across grade levels within the same strand have a relationship between mathematical concepts, and the key concepts for each grade level build on previous foundations while preparing students for future learning. Grade 5 sits near the upper end of the K-6 continuum: it assumes concrete experiences with counting, place value, basic fraction concepts, arrays, and area from K-4 and prepares students for rational-number fluency, formal algebraic reasoning, and geometric measurement in Grade 6 and beyond. Below, we trace six key mathematical strands from Kindergarten through Grade 6, with Grade 5 as the central reference point. This strategic progression of learning ensures that new understandings are built on previous foundations, and that students experience mathematics as an interconnected system rather than a set of disconnected skills.

The TEKS Introduction for Grade 5 identifies primary focal areas including performing operations with whole numbers and decimals, adding and subtracting fractions with unlike denominators, classifying two-dimensional figures, and solving volume problems. Each of these focal areas sits within a vertical progression that spans the full K-6 range, connecting patterns, big ideas, and relationships across every grade level.

Number System and Place Value

In Kindergarten and Grade 1, students build foundational number sense by counting, reading, and writing numbers to 20 and then to 120, composing and decomposing numbers, and understanding tens and ones (TEKS K.2, 1.2). Grade 2 extends this to reading, writing, and comparing numbers within 1,200 and deepens place-value understanding to hundreds (TEKS 2.2). Grade 3 introduces four- and five-digit numbers with standard, word, and expanded forms, and students begin comparing and ordering on number lines (TEKS 3.2). Grade 4 extends place-value understanding in two critical directions: to larger multi-digit whole numbers (comparing and rounding numbers over 1,000,000) and to decimals through hundredths, making explicit that tenths and hundredths are part of the existing base-10 system rather than a new set of rules (TEKS 4.2). Grade 5 is the next pivotal step: students read, write, compare, and round decimals through thousandths, deepening the base-ten structure by adding one more place-value position and reinforcing that the ten-to-one relationship applies uniformly across all places (TEKS 5.2). In Grade 6, the number system expands to include all rational numbers: integers, opposites, absolute value, and ordering across the full rational number line (TEKS 6.2). The decimal fluency that Grade 5 develops is what makes this expansion manageable, because students already understand how the base-ten system generates increasingly precise values.

Fractions and Rational Numbers

Kindergarten and Grade 1 lay informal groundwork through partitioning shapes into halves and quarters (TEKS K.6, 1.6.H). Grade 2 formalizes this by having students identify halves and quarters in shapes and partition two-dimensional figures (TEKS 2.3). Grade 3 is the first deep dive into fractions: students work with unit fractions, represent fractions with strip diagrams, area models, and number lines, explore equivalence, and compare fractions with the same numerator or denominator (TEKS 3.3). Grade 4 pivots from fraction concepts to fraction operations: students decompose fractions, generate equivalent fractions, compare fractions with unlike denominators, and add and subtract fractions and mixed numbers with like denominators (TEKS 4.3). Grade 5 marks the transition to computational fluency with fractions: students add and subtract fractions with unlike denominators, multiply fractions by whole numbers, and divide with unit fractions in both directions (dividing a unit fraction by a whole number and a whole number by a unit fraction) (TEKS 5.3.H-L). This is where fractions become fully operational quantities, not just "parts of a whole." Grade 6 extends to multiplication and division of all positive rational numbers, including dividing fractions by fractions and interpreting multiplication as scaling (TEKS 6.3). The fluency with unlike denominators and unit-fraction division that Grade 5 develops is the procedural bridge that makes the Grade 6 generalization possible.

Operations

Kindergarten focuses on adding and subtracting within 10 using objects and images (TEKS K.3). Grade 1 extends to addition and subtraction within 20, introducing strategies like making a 10, doubles, and counting on (TEKS 1.3, 1.5). Grade 2 builds fluency with two-digit operations and extends to three-digit addition and subtraction within 1,000, while also introducing multiplication and division as equal groups (TEKS 2.4, 2.6). Grade 3 develops multiplication and division fact fluency through 10×10, connects these to arrays and equal groups, and begins multi-digit multiplication of two-digit by one-digit numbers (TEKS 3.4-3.5). Grade 4 extends this to multi-digit multiplication (two-digit by two-digit and three/four-digit by one-digit) and division with up to four-digit dividends by one-digit divisors, including interpreting remainders (TEKS 4.4). Grade 5 is the computational capstone of the elementary sequence: students build fluency with larger multi-digit whole-number multiplication and division (including two-digit divisors), extend all four operations to decimals (multiplying decimals to hundredths, dividing decimals by whole numbers), and estimate sums, differences, products, and quotients across all number types (TEKS 5.3.A-G, 5.3.K). Grade 6 completes the progression by requiring fluency with all operations on positive rational numbers and introducing integer operations (TEKS 6.3). The decimal and estimation fluency developed in Grade 5 is the direct prerequisite for the multi-step rational-number computations that Grade 6 demands.

Algebraic Reasoning

Algebraic reasoning develops gradually across the elementary grades, growing from informal pattern work into formal expressions and equations. In Kindergarten and Grade 1, students identify and extend simple patterns with objects and numbers (TEKS K.5, 1.5). Grade 2 introduces even and odd numbers and finding 10 or 100 more or less than a given number, laying early groundwork for functional thinking (TEKS 2.7). Grade 3 formalizes this with unknowns in multiplication and division equations, real-world relationships represented with number pairs, and input-output tables (TEKS 3.5). Grade 4 extends to strip diagrams and equations with a letter standing for the unknown to represent multistep problems, and students generate and analyze numerical patterns through input-output tables and shape patterns (TEKS 4.5). Grade 5 is a pivotal year: students evaluate variable expressions involving decimals, describe the meaning of parentheses and brackets in numeric expressions, represent word problems as equations with unknowns, identify rules in input-output tables, and apply order of operations with grouping symbols (TEKS 5.4.B-F). This is the first time students work with expressions that require attention to the structure of the computation, not just its result. Grade 6 then makes the transition to formal algebra: students distinguish between expressions and equations, generate equivalent expressions using properties of operations, write and solve one-variable one-step equations and inequalities, and explore dependent and independent variables (TEKS 6.7, 6.9-6.10). The order-of-operations fluency and variable-expression reasoning that Grade 5 develops are the prerequisites that make the Grade 6 algebraic transition coherent rather than abrupt.

Geometry and Measurement

In Kindergarten and Grade 1, students identify and describe two-dimensional and three-dimensional shapes by their attributes and begin measuring with non-standard and standard units (TEKS K.6-K.7, 1.6-1.7). Grade 2 extends to area using unit squares and measurement with rulers (TEKS 2.8-2.9). Grade 3 formalizes area and perimeter: students tile rectangles, count unit squares, and compute perimeter by adding side lengths (TEKS 3.6-3.7). Grade 4 abstracts these experiences into formulas: perimeter as a sum and area as length times width. Students also classify two-dimensional shapes by geometric properties, measure angles, and convert units across metric and customary systems (TEKS 4.5-4.8). Grade 5 extends in three important directions: area formulas grow to include parallelograms and composite rectilinear figures, measurement moves from two dimensions to three dimensions with volume of rectangular prisms (using both unit cubes and the formula $V = l \times w \times h$), and students classify polygons and quadrilaterals by their properties while continuing customary and metric unit conversions with decimal values (TEKS 5.4.G-H, 5.5, 5.6, 5.7). Volume is a landmark concept: it connects the area models students used in Grades 3-4 to a new dimension, making explicit that volume is "area of the base times height," a multiplicative structure that deepens understanding of measurement as a whole. Grade 6 extends to area formulas for triangles, parallelograms, and trapezoids, volume of prisms with fractional side lengths, and coordinate graphing (TEKS 6.8, 6.11).

Data Analysis

Kindergarten and Grade 1 introduce representing and interpreting data through pictographs, picture graphs, and simple bar graphs with single-unit scales (TEKS K.8, 1.8). Grade 2 extends to bar graphs and pictographs with multi-unit scales (TEKS 2.10). Grade 3 adds line plots, frequency tables, and pictographs with two-, five-, or ten-unit scales (TEKS 3.8). Grade 4 builds on all of these by introducing line plots with fractional values and stem-and-leaf plots, explicitly linking data analysis to the fraction and decimal work from earlier strands (TEKS 4.9). Grade 5 marks a significant expansion: students work with bar graphs, line plots (including fractional intervals), stem-and-leaf plots, frequency tables, and, for the first time, scatterplots, while also solving one- and two-step problems using information from data representations (TEKS 5.9). The introduction of scatterplots connects data analysis to the coordinate-plane work in Chapter 10, reinforcing cross-strand coherence. Grade 6 introduces formal statistical measures (mean, median, mode, range, interquartile range) and more complex data displays, including box plots, histograms, and dot plots with rational-number values (TEKS 6.12-6.13). The multi-representation fluency that Grade 5 develops, reading, building, and reasoning from a variety of data displays, is the foundation that makes Grade 6 statistical reasoning accessible.

Part 4: Coherence and Concept Depth

Within-Pathway Coherence

Within each subchapter, Magma Math sequences problems to scaffold student understanding from concrete models to abstract applications. Because Magma does not prescribe a lesson sequence, this coherence appears in the structure of each learning pathway: students encounter tasks that move from models and visual supports to symbolic procedures and then to multistep applications. This ensures that students are not just memorizing procedures but building durable understanding of mathematical relationships.

The Scaffolding Framework: Mild, Medium, and Spicy

Magma Math uses a three-level scaffolding framework, Mild, Medium, and Spicy (M/M/S), that aligns with standards-based grading principles. The framework is grounded in a simple premise: every problem in a subchapter assesses the same grade-level standard. What changes across levels is not the mathematical content, but the degree of support provided to the student and the strategic demand of the task. Levels are visible only to teachers while they are creating assignments, although they may choose to reveal them to students if they so choose.

This approach ensures that all students, regardless of their entry point, are engaged with on-grade-level content. The levels are not remediation or acceleration. They are a deliberate instructional sequence that removes scaffolding incrementally and then increases strategic complexity, all within the boundaries of the current grade's TEKS.

Level	Characteristics
Mild	Students work on the grade-level standard with structured support. Problems include visual models, simplified numerical contexts, and direct prompts that isolate the core concept. The goal is to build confidence and activate prior knowledge while keeping students engaged with the current year's mathematics.
Medium	Students demonstrate the standard as written, without scaffolding. Visual supports are removed unless the standard itself requires interpreting a representation. Numbers reflect the full complexity expected at the grade level, and routine word problems require students to independently determine the appropriate operation or strategy.
Spicy	Students apply the same grade-level mathematics to tasks that require an additional layer of strategic thinking. This may involve error analysis, working backwards from a solution, synthesizing multiple pieces of information, or applying the concept in a non-routine context. The mathematical content does

	not advance to a future grade level. Instead, cognitive demand increases through the task's structure and framing.

Design principle: Magma Math sections progress by removing supports (Mild to Medium) and then increasing strategic thinking (Medium to Spicy), without drifting into past or future grade-level standards. A problem is not made Mild by reverting to a prior year's content, and a problem is not made Spicy by introducing next year's content or simply increasing numerical complexity.

Connecting Prior Knowledge to Current and Future Learning

The M/M/S progression serves as the mechanism by which Magma Math connects students' prior knowledge to the mathematical concepts and procedures they are learning and will encounter in future grades. This connection operates across four dimensions: prior conceptual knowledge and prior procedural knowledge, each linked to both current and future learning.

Connecting Prior Conceptual Knowledge to Current Grade-Level Learning

Mild problems in Magma Math activate the conceptual understanding students developed in Grade 4, providing a bridge from familiar models to new Grade 5 content. In the Operations on Fractions pathway (TEKS 5.3.H), Mild tasks present fraction addition using rectangular bar models that show equal parts shaded, allowing students to draw on their Grade 4 experience with area models and fraction decomposition (TEKS 4.3) while encountering unlike denominators for the first time. Similarly, in Understanding Decimals (TEKS 5.2.B), Mild problems ask students to compare two decimals using vertical bar models with shaded segments, directly linking to the hundred-grid comparison tasks from Grade 4 decimals (TEKS 4.2.E-F). By grounding entry-level tasks in visual representations students already know, Mild problems ensure that prior conceptual knowledge is not just recalled but actively used as a launchpad for deeper Grade 5 learning.

Connecting Prior Procedural Knowledge to Current Grade-Level Learning

Medium problems build on the procedural fluency students developed in Grade 4, requiring them to apply familiar algorithms in the expanded number domains of Grade 5. In Operations on Decimals (TEKS 5.3.K), Medium tasks ask students to add and subtract decimals to thousandths without scaffolding, relying on the place-value alignment and regrouping procedures students practiced with whole numbers and simpler decimals in Grade 4 (TEKS 4.4.A). In Operations on Whole Numbers (TEKS 5.3.B-C), Medium problems present multi-digit multiplication of two- and three-digit numbers and division of up to four-digit numbers by two-digit divisors, extending the standard algorithms students learned with smaller divisors in Grade 4 (TEKS 4.4.B-D). The removal of visual supports at the Medium level confirms that students have internalized the procedures from prior grades and can execute them independently with the increased numerical complexity expected at Grade 5.

Connecting Current Learning to Future Conceptual Demands

Spicy problems foreshadow the conceptual demands students will encounter in Grade 6 by requiring them to apply Grade 5 concepts in non-routine, multistep contexts. In Operations on Fractions (TEKS 5.3.H), a Spicy task asks students to determine whether two students who obtained different-looking but equivalent fraction sums are both correct, requiring reasoning about equivalence and multiple representations that previews the rational-number flexibility expected in Grade 6 (TEKS 6.3). In the Coordinate Systems pathway (TEKS 5.8.A-C), Spicy problems present a table of values and ask students to plot ordered pairs, draw a line through the points, and extend the pattern, connecting numerical patterns to graphical representations in a way that anticipates proportional reasoning and dependent/independent variable relationships in Grade 6 (TEKS 6.6). These tasks ensure that students who are ready for additional challenge are building the conceptual bridges they will need for success in future grades.

Connecting Current Learning to Future Procedural Demands

Medium problems also build the procedural automaticity that becomes a prerequisite in Grade 6. In Operations on Decimals (TEKS 5.3.D-E), Medium tasks require students to multiply decimals to hundredths without models or scaffolding, such as computing the total cost of a given number of items at a decimal price per unit. This decimal multiplication fluency is a direct prerequisite for the multi-step rational-number computations expected in Grade 6 (TEKS 6.3). In Expressions, Equations, and Patterns (TEKS 5.4.F), Medium problems require students to evaluate nested expressions using correct order of operations with brackets and parentheses, a procedural skill that Grade 6 extends into evaluating and writing one-variable equations and inequalities (TEKS 6.9-6.10). By building procedural fluency through unscaffolded, on-grade-level practice, Medium problems ensure that students carry forward the computational efficiency and accuracy they will need in more complex future work.

Across all four dimensions, the M/M/S structure ensures that each problem type within a subchapter builds on the one before it, and the full progression connects backward to foundational knowledge and forward to future learning goals.

Part 5: Types of Content and Representations

Concrete, Representational, and Abstract Models (CRA Progression)

Magma Math uses a deliberate Concrete-Representational-Abstract (CRA) progression that allows students to build understanding from visual, hands-on models toward symbolic fluency. Across Grade 5 pathways, Mild problems anchor new concepts in concrete or pictorial representations: fraction bars showing equal parts shaded for fraction addition (TEKS 5.3.H), base-ten blocks illustrating decimal addition where one whole is represented as a ten-by-ten grid with individual cubes for hundredths (TEKS 5.3.K), bar models partitioning a decimal quantity into equal groups for division (TEKS 5.3.F), number lines with fraction jumps for multiplying fractions by whole numbers (TEKS 5.3.I), and unit-cube constructions for volume (TEKS 5.6.A). Medium problems transition students to representational models: number lines for comparing and plotting decimals (TEKS 5.2.B), coordinate planes for graphing ordered pairs (TEKS 5.8.B), and labeled diagrams of rectangles and parallelograms for computing area (TEKS 5.4.H). Spicy problems operate at the abstract level, presenting multi-step computations, error-analysis scenarios, and real-world contexts that require students to choose or construct their own representations.

This progression supports students in connecting, creating, defining, and explaining mathematical representations. Students connect concrete models (such as fraction bars) to their abstract symbolic equivalents when Mild problems pair a shaded area model with a numeric fraction expression. Students create representations when they build line plots from data tables or plot ordered pairs on blank coordinate grids. Students define mathematical ideas when they identify which expression matches a sequence of operations involving parentheses or when they classify a polygon by counting its sides and analyzing its angles. Students explain their reasoning when Spicy tasks ask them to evaluate whether two equivalent-looking fraction sums are both valid or to determine a missing vertex of a rectangle on the coordinate plane using spatial reasoning.

Interpret, Analyze, and Evaluate

Interpret

Mild problems in Magma Math require students to interpret mathematical concepts and real-world situations by reading and making sense of visual models and structured prompts. In the Data Analysis pathway (TEKS 5.9.A), a Mild problem presents a bar chart showing students' favorite animals and asks which animal was most popular, requiring students to interpret the heights of bars as quantities. In Understanding Decimals (TEKS 5.2.A), Mild tasks ask students to identify the expanded form of a decimal, requiring them to interpret place-value structure. These tasks build the interpretive foundation that supports more complex analysis.

Analyze

Medium problems require students to analyze mathematical situations by comparing, classifying, and determining relationships without scaffolding. In Perimeter and Area (TEKS 5.4.H), a Medium problem shows two labeled figures and asks whether they have equal areas, requiring students to analyze each figure's dimensions and compare computed values. In Data Analysis (TEKS 5.9.B), Medium tasks present a data table alongside a partially plotted scatterplot and ask students to identify which points are correctly placed, requiring analysis of coordinate relationships. In Operations on Fractions (TEKS 5.3.H), Medium problems require students to add fractions with unlike denominators by analyzing the relationship between the two denominators and finding a common one.

Evaluate

Spicy problems require students to evaluate mathematical reasoning, strategies, and solutions. In Operations on Fractions (TEKS 5.3.H), a Spicy problem describes two students who arrive at different-looking answers for the same fraction sum and asks who is correct, requiring evaluation of whether both expressions are equivalent. In the Data Analysis pathway (TEKS 5.9.A), a Spicy task presents a dot plot of dog weights and asks students to select two statements that accurately describe the distribution, requiring them to evaluate multiple claims against the data. In Perimeter and Area (TEKS 5.4.H), a Spicy problem gives a rectangle's perimeter and one dimension and asks for the area, requiring students to evaluate which computational steps are needed and to execute them in sequence.

Apply to New Situations

Spicy problems across Grade 5 pathways require students to apply conceptual understanding to new problem situations and contexts that extend beyond routine practice. In Operations on Decimals (TEKS 5.3.D-E), a Spicy task gives a rectangle's perimeter and the relationship between its length and width (for example, the length is 3.5 feet more than the width) and asks students to calculate the area, requiring them to synthesize decimal operations with geometric reasoning in a non-routine context. In Expressions, Equations, and Patterns (TEKS 5.4.E), a Spicy problem presents a multi-step real-world scenario about items being sold and restocked and asks students to select the numeric expression that models the situation, requiring transfer of order-of-operations understanding to an unfamiliar story. In Volume (TEKS 5.4.G), a Spicy task describes a box with given dimensions and states it was filled to a fraction of its capacity, requiring students to combine volume computation with fraction reasoning. These tasks ensure that students can transfer concepts and procedures to situations they have not previously encountered.

Automaticity and Fluency

Medium problems in Magma Math serve as the primary vehicle for building automaticity and fluency with Grade 5 procedures. In Operations on Decimals (TEKS 5.3.K), Medium tasks present decimal addition and subtraction computations without visual models or contextual scaffolding, providing the structured repetition students need to develop automatic recall of place-value alignment and regrouping steps. In Operations on Fractions (TEKS 5.3.H), Medium problems ask students to add fractions with unlike denominators as bare computations, building fluency with finding common denominators and simplifying results. In Operations on Whole Numbers (TEKS 5.3.B-C), Medium problems require multi-digit multiplication and division at the full complexity expected at the grade level, supporting fluency through repeated, unscaffolded practice. Across all pathways, Medium tasks are designed so that students carry out procedures flexibly, accurately, and efficiently, building the automaticity that frees cognitive resources for more complex problem solving in Spicy tasks and in future grades.

Efficiency, Flexibility, and Accuracy

Magma Math provides students with opportunities to evaluate representations, models, strategies, and solutions for efficiency, flexibility, and accuracy. Efficiency is developed when students compare computational paths: in Operations on Decimals (TEKS 5.3.D-E), Spicy problems ask students to compare two multiplication expressions and determine which is greater without fully computing both, encouraging students to look for shortcuts based on place-value reasoning. Flexibility is built when problems accept or require multiple valid approaches: in Operations on Fractions (TEKS 5.3.H), a Spicy task presents two students' solutions that look different but are both correct, requiring students to recognize that more than one strategy can produce a valid result. Accuracy is reinforced through error-analysis tasks: in Expressions, Equations, and Patterns (TEKS 5.4.B), Spicy problems give a real-world scenario and ask students to identify which equation correctly models it, requiring careful attention to the relationship between operations and the quantities described. Across all three dimensions, the M/M/S framework ensures that students move beyond rote computation toward strategic, reflective mathematical practice.

Part 6: Process Standards Integration

Overview

The TEKS process standards (A) through (G) are integrated across all Grade 5 learning pathways in Magma Math. The M/M/S scaffolding framework ensures that process standards are not isolated into separate activities but are woven into the problem-solving experience at every level. Mild problems emphasize process standards (B) using models and representations and (D) selecting appropriate tools, because entry-level tasks rely on visual models and structured supports. Medium problems emphasize (A) applying mathematics to problems arising in everyday life and (E) creating and using representations, because students at this level must independently select and execute appropriate strategies. Spicy problems emphasize (C) selecting tools including real objects and technology, (F) analyzing mathematical relationships, and (G) displaying, explaining, and justifying mathematical ideas, because advanced tasks require strategic reasoning, multiple-step synthesis, and evaluation of mathematical claims.

How Process Standards Are Incorporated Throughout Learning Pathways

(A) Apply mathematics to everyday life, society, and the workplace

At the Mild level, in Operations on Decimals (TEKS 5.3.E), a task describes buying a set of books at a given price per book and asks for the total cost, grounding decimal multiplication in a familiar purchasing context. At the Medium level, in the same pathway (TEKS 5.3.F), a problem describes tomatoes purchased at a decimal price per pound and a given weight, requiring students to independently set up and carry out the multiplication. At the Spicy level, in Operations on Decimals (TEKS 5.3.E-G), a problem describes two siblings splitting the cost of a discounted gift, requiring students to combine multiplication, subtraction, and fraction reasoning to determine each person's share. Across all three levels, students apply mathematical procedures to realistic scenarios with increasing independence and complexity.

(B) Use a problem-solving model: analyze, formulate, determine, justify, evaluate

At the Mild level, in Operations on Fractions (TEKS 5.3.J-L), a division task shows a rectangle divided into equal columns with one column shaded, then further subdivided by horizontal lines, providing a concrete area model that directly represents the computation. At the Medium level, in the same pathway, a number line marked in unit fractions replaces the area model, shifting the representation while maintaining the same mathematical concept. At the Spicy level, in Volume (TEKS 5.6.A), students encounter composite three-dimensional figures built from unit cubes with stepped and L-shaped configurations, requiring them to decompose the figure into rectangular sub-sections and combine partial volumes. This progression across representations ensures that students can move fluidly among concrete, pictorial, and abstract models.

(C) Select tools, including real objects, manipulatives, paper and pencil, and technology

At the Mild level, in Converting Units (TEKS 5.7.A), problems provide a reference table listing conversion factors (for example, 1 pound = 16 ounces) and ask students to apply the table to convert a single quantity, making the tool selection explicit. At the Medium level, in the same pathway, the reference table is removed and students must recall or derive the conversion factor independently, choosing the appropriate multiplicative relationship. At the Spicy level, in Converting Units (TEKS 5.7.A), a problem describes a real-world scenario involving multiple steps and mixed units (for example, computing the total length in millimeters when given seven rulers each 30 centimeters long), requiring students to select and sequence multiple tools and operations. This progression ensures that students develop independence in choosing the tools appropriate to a given mathematical task.

(D) Communicate mathematical ideas using multiple representations

At the Mild level, in Expressions, Equations, and Patterns (TEKS 5.4.C), input-output tables present a rule and ask students to complete missing values, communicating the pattern through a tabular representation. At the Medium level, in the same pathway, students identify the next three numbers in a sequence without a table structure, communicating their understanding of the rule through the sequence itself. At the Spicy level, in Coordinate Systems (TEKS 5.8.B-C), students are given a table of values, asked to plot the ordered pairs on a coordinate grid, draw a connecting line, and extend the pattern, communicating the mathematical relationship across three linked representations: table, graph, and line. These tasks collectively develop students' ability to express mathematical thinking through varied forms.

(E) Create and use representations to organize, record, and communicate

At the Mild level, in Data Analysis (TEKS 5.9.A), students read a completed bar chart and answer a direct question about which category has the highest bar, using an existing representation. At the Medium level, in the same pathway (TEKS 5.9.A), students are given a frequency table and a blank line plot template and must create the representation by plotting data points at fractional intervals. At the Spicy level, in Data Analysis (TEKS 5.9.A), a problem provides a set of verbal clues about movie counts and a blank bar graph, requiring students to construct the entire bar graph from scratch before answering a comparison question. This progression moves students from interpreting ready-made displays to independently creating representations that organize and communicate data.

(F) Analyze mathematical relationships to connect and communicate

At the Mild level, in Operations on Decimals (TEKS 5.3.D), a task presents repeated addition of a decimal (for example, 0.2 + 0.2 + 0.2) and asks students to rewrite it as a multiplication expression, making the relationship between addition and multiplication explicit. At the Medium level, in Operations on Whole Numbers (TEKS 5.4.A), students identify whether numbers are prime or composite, analyzing the multiplicative structure of numbers. At the Spicy level, in Perimeter and Area (TEKS 5.4.H), a problem gives the base of a parallelogram and a relationship between the height and base (for example, the height is 5 less than 3 times the base) and asks for the area, requiring students to analyze and connect multiple algebraic and geometric relationships within a single task. These problems develop the ability to see and articulate how mathematical ideas relate to one another.

(G) Display, explain, and justify using precise mathematical language

At the Mild level, in 2D Figures (TEKS 5.5.A), students are shown a set of shapes and asked to select the ones that are quadrilaterals, justifying their choice by analyzing each shape's attributes against the definition. At the Medium level, in Understanding Decimals (TEKS 5.2.A), a problem asks students to determine how many hundredths are in a tenth and to select the answer with the correct justification, requiring them to explain the multiplicative relationship between place values. At the Spicy level, in 2D Figures (TEKS 5.5.A), students are told that a classmate claims three specific statements describe a square, but the classmate is incorrect; students must select the three statements that actually must be true for a square, justifying their reasoning by evaluating each statement against the properties of squares. This progression ensures that students can articulate their mathematical thinking with increasing precision and rigor.

Process Standards by Chapter

Chapter	Primary Process Standards Emphasis
Ch 1: Understanding Decimals	(A) Problem solving: rounding and comparing decimals in real-world contexts; (B) Models: using bar models and number lines to represent decimal values; (D) Tools: number lines and place-value charts; (E) Estimation: rounding decimals to benchmark values
Ch 2: Operations on Whole Numbers	(A) Problem solving: multi-step word problems with multiplication and division; (C) Patterns: identifying prime and composite numbers; (E) Estimation: estimating sums, differences, products, and quotients; (F) Relationships: connecting multiplication and division as inverse operations
Ch 3: Operations on Decimals	(A) Problem solving: complex money word problems requiring multiple operations; (B) Models: base-ten blocks and bar models for decimal operations; (D) Tools: place-value charts for aligning decimals; (G) Reasonableness: checking decimal computation results against estimates
Ch 4: Operations on Fractions	(A) Problem solving: word problems involving fraction division in real-world contexts; (B) Models: fraction bars, area models, and number lines; (C) Patterns: recognizing equivalent fraction relationships; (E) Estimation: estimating fraction sums using benchmarks

Ch 5: Expressions, Equations, and Patterns	(A) Problem solving: translating word problems into equations with unknowns; (C) Patterns: extending input-output tables and identifying rules; (D) Tools: grouping symbols to organize multi-step computations; (F) Relationships: connecting operations within expressions
Ch 6: Perimeter and Area	(A) Problem solving: finding unknown dimensions given area or perimeter constraints; (B) Models: labeled diagrams of rectangles, parallelograms, and composite figures; (E) Estimation: estimating areas of irregular figures; (F) Relationships: connecting area formulas to multiplication
Ch 7: 2D Figures	(B) Models: visual classification of polygons and quadrilaterals by attributes; (C) Patterns: recognizing hierarchical relationships among quadrilateral types; (G) Reasonableness: verifying classifications against definitions
Ch 8: Volume	(A) Problem solving: real-world volume tasks involving partially filled containers; (B) Models: unit-cube constructions and labeled prism diagrams; (D) Tools: volume formula $V = l \times w \times h$; (F) Relationships: connecting area of the base to volume through repeated layers
Ch 9: Converting Units	(A) Problem solving: multi-step conversion word problems; (D) Tools: conversion reference tables; (E) Estimation: estimating conversions using benchmark equivalences; (F) Relationships: connecting metric prefixes to powers of ten
Ch 10: Coordinate Systems	(A) Problem solving: finding missing vertices of polygons on the coordinate plane; (B) Models: coordinate grids for plotting and reading ordered pairs; (C) Patterns: extending graphical patterns by connecting plotted points; (D) Tools: coordinate plane as an organizational tool
Ch 11: Data Analysis	(A) Problem solving: one- and two-step problems using data from graphs and plots; (B) Models: bar graphs, line plots, stem-and-leaf plots, and scatterplots; (C) Patterns: identifying trends and outliers in data displays; (G) Reasonableness: evaluating whether statements about data distributions are supported by the display

End of Alignment Guide. Grade 5. Magma Math IMRA Submission.