magma

ALIGNMENT GUIDE

Grade 6

What this document covers

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 (number lines with integers and rational numbers, vertical bar models for decimal comparison, 10x10 grids for percent representation, coordinate planes with plotted points and graphed lines, box plots, dot plots, histograms, stem-and-leaf plots, algebra tiles for combining like terms, triangle and polygon diagrams with labeled angles, area models for fraction multiplication, and tables displaying input-output relationships) 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 number lines with integers and rational numbers, vertical bar models for decimal comparison, 10x10 grids for percent representation, coordinate planes with plotted points and graphed lines, box plots, dot plots, histograms, stem-and-leaf plots, algebra tiles for combining like terms, triangle and polygon diagrams with labeled angles, area models for fraction multiplication, and tables displaying input-output relationships. 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. 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 6 Learning Paths

The Grade 6 scope and sequence is organized into three Instructional Strands that reflect the mathematical strands and focal areas defined in the TEKS introduction for Grade 6 mathematics (19 TAC §111.26). TEKS within the same strand relate to the same big idea, and TEKS across strands connect in a variety of ways. These strands are designed to build conceptual understanding before application, connecting patterns, big ideas, and relationships within the grade so that students see later topics as extensions of earlier ones rather than isolated skills. Mathematics tells a continuous, connected story, and the strand organization ensures that Grade 6 students experience that story coherently throughout the year.

Strand 1: Number Systems and Operations (Chapters 1-4)

Grade 6 begins by extending students' understanding of the number system to include all rational numbers, including negative integers, fractions, and decimals. Chapter 1 (Understanding and Representing Rational Numbers) establishes the foundational concepts of classifying rational numbers, locating integers and rational numbers on number lines, understanding absolute value and opposites, and comparing and ordering rational numbers (TEKS 6.2.A-D). Chapter 2 (Operations on Positive Rational Numbers) builds on this number sense by requiring students to multiply and divide fractions and decimals, interpret multiplication as scaling, and relate fractions to division (TEKS 6.2.E, 6.3.A-B, 6.3.E). Chapter 3 (Operations on Integers) extends arithmetic to negative numbers through addition, subtraction, multiplication, and division of integers (TEKS 6.3.C-D). Chapter 4 (Converting Units) applies rational number understanding to measurement contexts, requiring students to convert between customary and metric units using multiplication and division of decimals (TEKS 6.4.H). The sequencing ensures that students establish a solid understanding of the rational number system before they are asked to operate on those numbers in increasingly complex settings.

Strand 2: Proportional Reasoning and Algebraic Thinking (Chapters 5-8)

Once number sense and operational fluency are established, Strand 2 shifts focus to proportional relationships and early algebraic reasoning. Chapter 5 (Understanding Proportional Relationships) introduces ratios, rates, unit rates, equivalent ratios, and proportional graphs, connecting numerical patterns to multiplicative relationships (TEKS

6.4.A-F, 6.5.A). Chapter 6 (Percent) links proportional reasoning to percent representation, requiring students to convert between fractions, decimals, and percents and to solve percent problems involving parts, wholes, and rates (TEKS 6.4.E, 6.4.G, 6.5.A-C). Chapter 7 (Expressions) formalizes algebraic language: students distinguish expressions from equations, apply order of operations with exponents, generate equivalent expressions using properties of operations, and factor and expand linear expressions (TEKS 6.7.A-D). Chapter 8 (Linear Equations and Inequalities) synthesizes the algebraic strand: students identify independent and dependent variables, write and solve one-step equations and inequalities, represent situations with equations of the form y = kx or y = x + b, and check solutions (TEKS 6.6.A-C, 6.9.A-B, 6.10.A-B). This strand intentionally links proportional reasoning with early algebra so that students see equations and expressions as tools for describing the multiplicative relationships they explored in Chapters 5 and 6.

Strand 3: Geometry, Measurement, and Data (Chapters 9-11)

The final strand applies the numerical and algebraic skills from Strands 1 and 2 to geometric, measurement, and statistical contexts. Chapter 9 (Geometry) connects algebraic expressions to measurement formulas: students explore angle relationships in triangles, calculate areas of parallelograms, triangles, and trapezoids, write area and volume equations, and compute volumes of right rectangular prisms with fractional side lengths (TEKS 6.8.A-D). Chapter 10 (Displaying and Interpreting Data) requires students to graph on the coordinate plane with rational coordinates, create and interpret box plots, dot plots, histograms, and stem-and-leaf plots (TEKS 6.11.A, 6.12.A, 6.12.D, 6.13.A). Chapter 11 (Statistical Measures) deepens data analysis: students describe data distributions, calculate mean, median, mode, range, and interquartile range, identify outliers, and summarize data sets using five-number summaries and percent bar graphs (TEKS 6.12.B-D). The sequencing is intentional: area and volume tasks in Chapter 9 assume fraction and decimal fluency from Strand 1, and statistical displays in Chapters 10 and 11 require the coordinate plane skills and rational number understanding developed earlier, so students' cognitive energy is focused on geometric and statistical reasoning, not basic computation.

Artifact 2.1: Grade 6 Scope and Sequence

Seq	Chapter (Learning Pathway)	Subchapters	Focus TEKS
1	Understanding and representing rational numbers (6.2.A-D)	Classify numbers: rational, integers, and whole numbers; Integers as opposites; Absolute value; Integers on the number line; Rationals on vertical and horizontal number lines; Comparing integers; Comparing decimals; Comparing rational numbers; Ordering fractions; Ordering rational numbers	6.2.A, 6.2.B, 6.2.C, 6.2.D

2	Operations on positive rational numbers (6.2.E, 6.3.A-B, 6.3.E)	Relating fractions to division; Dividing fractions; Multiply fractions; Multiplying decimals; Dividing decimals; Multiplying mixed and whole numbers; Dividing mixed and whole numbers; Interpreting multiplication as scaling or resizing	6.2.E, 6.3.A, 6.3.B, 6.3.E
3	Operations on integers (6.3.C-D)	Adding integers; Subtracting integers; Multiplying integers; Dividing integers	6.3.C, 6.3.D
4	Converting units (6.4.H)	Converting length, customary; Converting length, metric, with decimals; Converting volume, metric, with decimals; Converting weight, customary; Converting weight, metric, with decimals	6.4.H
5	Understanding proportional relationships (6.4.A-F, 6.5.A)	Comparing patterns; Understanding ratios; Rates and unit rates; Comparing unit rates; Equivalent ratios; Ratio tables; Solving proportions; Graphs of proportional relationships; Represent benchmark fractions and percents	6.4.A, 6.4.B, 6.4.C, 6.4.D, 6.4.E, 6.4.F, 6.5.A
6	Percent (6.4.E, 6.4.G, 6.5.A-C)	Percent from figure; Converting between percents and decimals; Converting between percents and fractions; Converting between fractions, decimals, and percents; Find part with percents; Find percents; Find whole with percents	6.4.E, 6.4.G, 6.5.A, 6.5.B, 6.5.C
7	Expressions (6.7.A-D)	Order of operations with integers; Order of operations with exponents; Prime factorization; Equivalent expressions using exponents; Distinguish between expressions and equations; Simplifying linear expressions; Identifying equivalent linear expressions; Expanding linear expressions; Factoring linear expressions; Multiplying numbers by terms in linear expressions; Equivalent expressions using properties of operations	6.7.A, 6.7.B, 6.7.C, 6.7.D
8	Linear equations and inequalities (6.6.A-C, 6.9.A-B, 6.10.A-B)	Dependent and independent variables; Represent a situation for y = kx or y = x + b; Write an equation from a table; Writing one-step equations; Writing one-step inequalities; Solving one-step equations with addition and subtraction; Solving one-step equations with multiplication and division; Solving one-step inequalities with addition and subtraction; Solving one-step inequalities with multiplication and division; Checking solutions of one-step equations; Checking solutions of	6.6.A, 6.6.B, 6.6.C, 6.9.A, 6.9.B, 6.10.A, 6.10.B

		one-step inequalities; Inequalities as constraints	
9	Geometry (6.8.A-D)	Angle sum and exterior angles; Constructing triangles; Area of parallelograms; Area of right triangles; Area of triangles; Area of trapezoids; Area of rectangles with fractional lengths; Writing area equations; Writing volume equations; Volume of right rectangular prisms; Volume of right rectangular prisms with fractional side lengths	6.8.A, 6.8.B, 6.8.C, 6.8.D
10	Displaying and interpreting data (6.11.A, 6.12.A, 6.12.D, 6.13.A)	Quadrants; Plotting points with rational coordinates; Box plots; Dot plots; Histograms; Stem-and-leaf plots	6.11.A, 6.12.A, 6.12.D, 6.13.A
11	Statistical measures (6.12.B-D)	Describing data distribution; Mean; Median; Mode; Range; Mean, median, mode, and range; Interquartile range; Identifying outliers; 5-number summary; Percent bar graphs; Two-way tables	6.12.B, 6.12.C, 6.12.D

Part 3: Vertical Alignment (Grades 3-12 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 connect patterns, big ideas, and relationships between mathematical concepts, and the key concepts for each grade level build on previous foundations while preparing students for future learning. Grade 6 sits at a pivotal transition in the 3-12 continuum: it is where students formally extend the number system to include all rational numbers, formalize proportional reasoning, and begin algebraic thinking. The Grade 6 TEKS introduction states that students should "build on the Grade 5 TEKS, which provide a foundation in number and operations, proportionality, geometry, and measurement and data analysis" (19 TAC §111.26). Below, we trace five key mathematical strands from Grade 3 through the high school course sequence, with Grade 6 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.

Linear Relationships and Proportional Reasoning

In Grades 3-5, students explore multiplicative relationships through equal groups, arrays, and input-output tables, generating numerical patterns and describing relationships between paired quantities (TEKS 3.5, 4.5, 5.4). Grade 6 formalizes this work into ratios, rates, and unit rates, requiring students to compare two quantities using ratio language, generate equivalent ratios using tables, and graph proportional relationships on the coordinate plane (TEKS 6.4, 6.5). Students also represent relationships with equations of the form $y = kx$ and $y = x + b$, identifying independent and dependent variables (TEKS 6.6). Grade 7 deepens proportional reasoning by applying it to constant rates of change, similar figures, and percent increase and decrease (TEKS 7.4, 7.5). Grade 8 formalizes the transition to linear functions: students distinguish proportional from non-proportional linear relationships, define slope as a rate of change, and write equations in $y = mx + b$ form (TEKS 8.4, 8.5). Algebra I provides a comprehensive study of linear functions through multiple representations and solution methods (TEKS A.2, A.3, A.5), and Algebra II extends to systems of three equations and more complex function analysis (TEKS A2.3).

Expressions, Equations, and Algebraic Reasoning

In Grades 3-5, students represent unknowns in equations, use strip diagrams, and generate equivalent expressions using properties of operations (TEKS 3.5, 4.5, 5.4). Grade 6 marks the formal transition to algebra: students distinguish expressions from equations, generate equivalent expressions by combining like terms and using the distributive property, write and solve one-step equations and inequalities, and apply order of operations with exponents (TEKS 6.7, 6.9, 6.10). Grade 7 extends to two-step equations and inequalities with rational number coefficients (TEKS 7.10, 7.11). Grade 8 requires solving multi-step equations with variables on both sides, including those with rational coefficients and cases with no solution or infinitely many solutions (TEKS 8.8). Algebra I provides the full algebraic toolkit: students solve multi-step equations and inequalities, manipulate literal equations, perform operations on polynomials, and factor quadratic expressions (TEKS A.5, A.10, A.11, A.12.E). Algebra II extends to rational expressions, radical equations, and polynomial division (TEKS A2.7).

Non-Linear Functions and Patterns

In Grades 3-5, students explore patterns through input-output tables and describe rules for generating sequences (TEKS 3.5, 4.5, 5.4). Grade 6 introduces students to patterns that grow by different rules, including additive and multiplicative growth, through comparing tables of two different classes' progress (TEKS 6.4.A, 6.6). This is also the first encounter with exponents through order of operations and prime factorization (TEKS 6.7.A). Grade 7 develops proportional and non-proportional reasoning more deeply (TEKS 7.4, 7.7). Grade 8 introduces the Pythagorean theorem and squared quantities in geometric contexts (TEKS 8.6, 8.7). Algebra I provides formal treatment of quadratic and exponential functions through multiple representations and solution methods (TEKS A.6, A.7, A.8, A.9). Algebra II expands to all function families: polynomial, rational, radical, exponential, and logarithmic (TEKS A2.2, A2.4-A2.8).

Number Systems and Operations

In Grades 3-5, students develop fluency with operations on positive whole numbers, fractions, and decimals (TEKS 3.3-3.5, 4.3-4.4, 5.3). Grade 6 is the critical extension: students expand the number system to include all rational numbers, classify numbers as whole, integer, or rational, understand absolute value and opposites, and perform all four operations on integers and positive rational numbers including fraction and decimal multiplication and division (TEKS 6.2, 6.3). Grade 7 extends operations to all rational numbers and applies them in complex contexts (TEKS 7.2, 7.3). Grade 8 introduces irrational numbers and the real number system, ordering real numbers on a number line and approximating irrational values (TEKS 8.2). Algebra I works within the real number system throughout: students operate on polynomial expressions with real coefficients and evaluate functions at real-valued inputs (TEKS A.10, A.11). Algebra II introduces complex numbers, completing the extension from natural numbers to the full complex number system (TEKS A2.7).

Data Analysis and Statistical Reasoning

In Grades 3-5, students collect, organize, and interpret data using pictographs, bar graphs, line plots, dot plots, frequency tables, and stem-and-leaf plots (TEKS 3.8, 4.9, 5.9). Grade 6 introduces formal statistical measures and more complex displays: students create and interpret box plots, dot plots, histograms, and stem-and-leaf plots, calculate mean, median, mode, range, and interquartile range, identify outliers, describe data distributions, summarize data with five-number summaries, and graph on the coordinate plane with rational coordinates (TEKS 6.11, 6.12, 6.13). Grade 7 deepens statistical reasoning with mean absolute deviation and population sampling methods (TEKS 7.6, 7.12). Grade 8 develops bivariate data analysis: students construct scatter plots, describe trend patterns, and use linear approximations to make predictions (TEKS 8.5, 8.11). Algebra I formalizes this work with correlation coefficients, regression equations, and the distinction between correlation and causation (TEKS A.4.A-C). Algebra II extends to non-linear regression models and residual analysis (TEKS A2.4).

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

At the Mild level, problems activate students' prior conceptual understanding from Grade 5 by using familiar models and representations while introducing a new Grade 6 concept. In the Understanding and Representing Rational Numbers pathway (TEKS 6.2.C-D), Mild problems display two integers circled on a number line and ask students to determine which is greater. This directly leverages the Grade 5 understanding of number lines and comparing whole numbers and decimals (TEKS 5.2), bridging the prior concept of comparing positive numbers to the new concept of ordering integers that include negative values. Similarly, in the Operations on Positive Rational Numbers pathway (TEKS 6.3.A), Mild problems present a rectangle divided into equal parts with a portion shaded, alongside a fraction division expression, asking students to use the area model to find the quotient. The visual representation connects to Grade 5 work with fraction models and area representations (TEKS 5.3), ensuring students build new understanding of fraction division on a visual foundation they already possess.

Connecting Prior Procedural Knowledge to Current Grade-Level Learning

At the Medium level, students apply and extend procedural skills they developed in Grade 5 to perform current grade-level tasks. In the Operations on Positive Rational Numbers pathway (TEKS 6.3.E), Medium problems present decimal division such as 4.25 ÷ 0.25 without visual models or scaffolding. Students rely on procedural fluency with decimal operations developed in Grade 5 (TEKS 5.3) while extending to division contexts that require understanding of decimal place value at the Grade 6 level. In the Expressions pathway (TEKS 6.7.C), Medium problems require students to simplify linear expressions by combining like terms without algebra tiles or visual support. The scaffolding is removed; students must independently identify like terms and apply properties of operations, extending the procedural foundation of evaluating expressions and applying order of operations built across Grade 5 (TEKS 5.4).

Connecting Current Learning to Future Conceptual Demands

At the Spicy level, problems foreshadow future conceptual demands by requiring students to synthesize, generalize, or transfer concepts. In the Understanding Proportional Relationships pathway (TEKS 6.4.A), Spicy problems present two classes generating sequences by different rules, one additive and one multiplicative, displayed in side-by-side tables, and ask students to determine when one quantity overtakes the other. This multi-constraint reasoning, comparing linear and exponential growth patterns, previews the function analysis demands of Grade 8 and Algebra I (TEKS 8.5, A.9). In the Linear Equations and Inequalities pathway (TEKS 6.10.B), Spicy problems embed equation-checking in real-world contexts: a student must determine whether a train traveling at 80 miles per hour can reach a stop 280 miles away in exactly 3.5 hours, requiring the student to formulate the equation, evaluate it, and reason about the result in context. This multi-step contextual reasoning previews the modeling demands of Grade 7 and Grade 8. The mathematical content stays within Grade 6, but the strategic complexity builds conceptual habits that future grades require.

Connecting Current Learning to Future Procedural Demands

The progression also prepares students procedurally for future grades. As students move from Mild to Medium within a Grade 6 subchapter, they internalize procedures that become prerequisite fluencies in Grade 7 and beyond. In the Expressions pathway (TEKS 6.7.C), Medium problems develop fluency with combining like terms and applying the distributive property to generate equivalent expressions. Grade 7 assumes this fluency in the context of solving two-step equations and writing expressions for real-world situations (TEKS 7.10, 7.11). At the Spicy level, problems in the Geometry pathway (TEKS 6.8.A) require students to find unknown angle measures in triangles where angles are expressed as algebraic expressions such as x and $(2x - 30)$, combining geometric reasoning with equation solving. This procedural complexity directly prepares students for the algebraic and geometric synthesis required in Grade 7 and Grade 8. The M/M/S structure ensures that procedural fluency is not developed in isolation but within a coherent progression that serves both current mastery and future readiness.

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

Magma Math provides opportunities for students to engage with mathematical concepts through concrete models, pictorial representations, and abstract (symbolic/numeric/algorithmic) models, as required by the TEKS. The M/M/S scaffolding structure maps naturally to the Concrete-Representational-Abstract (CRA) progression: Mild problems tend to anchor understanding in concrete and pictorial models, Medium problems transition to abstract procedures, and Spicy problems require flexible movement between representations.

Concrete and pictorial models. Mild problems across Magma Math's Grade 6 course use a range of visual representations to ground new concepts before students work symbolically. In the Understanding and Representing Rational Numbers pathway (TEKS 6.2.D), vertical bar models divided into ten equal segments with portions shaded allow students to compare decimals such as 0.2 and 0.5 by counting shaded sections before applying symbolic comparison rules. In the Operations on Positive Rational Numbers pathway (TEKS 6.3.A), area model grids show rows and columns with crosshatched overlap regions, making the product of two fractions visible before students apply the multiplication algorithm. In the Displaying and Interpreting Data pathway (TEKS 6.12.A), box plots on labeled number lines display the distribution of a data set, allowing students to read the median and range directly from the visual before computing summary statistics. In the Operations on Integers pathway (TEKS 6.3.D), groups of circles each labeled with negative one illustrate integer division, and number lines with directional jumps show integer multiplication, grounding signed-number operations in concrete visual reasoning.

Transition to abstract models. Medium problems remove these visual supports and require students to work with symbolic and algorithmic representations. Comparing rational numbers appears without bar models or number lines. Dividing decimals requires executing the algorithm without conversion tables. Simplifying linear expressions requires combining like terms without algebra tiles. This deliberate removal of the concrete scaffold is what distinguishes Medium from Mild: the mathematical content is the same, but the representational demand shifts to the abstract.

Connecting, creating, defining, and explaining representations. Spicy problems frequently require students to create representations and to define or explain how those representations connect to abstract concepts. In the Displaying and Interpreting Data pathway (TEKS 6.13.A), Spicy tasks present a raw data set and ask students to construct a box plot, requiring them to calculate quartiles and create the graphical representation from scratch. In the Geometry pathway (TEKS 6.8.C), students write area and volume equations from labeled diagrams, defining the algebraic relationship between geometric dimensions and measurement outcomes. In the Expressions pathway (TEKS 6.7.C), a Spicy problem presents a triangle with sides labeled as algebraic expressions and a given perimeter, requiring students to create an equation, connect the geometric and algebraic representations, and explain the relationship between the expression and the figure. Throughout Magma Math, students are not only interpreting provided models but actively constructing, defining, and explaining how concrete and pictorial representations relate to the abstract mathematical concepts they encode.

Interpreting, Analyzing, and Evaluating

Magma Math problems across all levels require students to interpret, analyze, and evaluate mathematical concepts and situations, not merely compute. This is built into the M/M/S framework by design.

Interpret

At the Mild level, interpretation is the primary cognitive demand. Students examine a box plot on a number line and identify the median and range from the visual (TEKS 6.12.A), interpret a coordinate plane to identify which quadrant a plotted point falls in (TEKS 6.11.A), or read an input-output table to determine which rule describes the relationship between paired quantities (TEKS 6.4.A). These tasks activate comprehension before computation.

Analyze

At the Medium level, analysis takes center stage. Determining whether a given value makes a multi-step equation true requires analyzing the algebraic structure and substituting systematically (TEKS 6.10.B). Reading a stem-and-leaf plot to answer questions about the distribution of data values requires analyzing the display's structure to locate specific information (TEKS 6.12.A). Writing the equation represented by a line on a coordinate graph requires analyzing the relationship between plotted points and algebraic form (TEKS 6.6.C).

Evaluate

At the Spicy level, evaluation is foregrounded. Tasks ask students to evaluate whether an inequality is an expression, an equation, or neither, requiring conceptual judgment about mathematical structure (TEKS 6.7.B). Problems that present four different data displays and ask students to select the two that are left-skewed demand evaluation of competing representations (TEKS 6.12.B). Multi-constraint real-world problems, such as determining whether a person can afford exactly a given number of items at a specific price, require students to formulate, evaluate, and justify their reasoning (TEKS 6.10.B). These problems demand judgment, not just execution.

Applying Conceptual Understanding to New Situations

Spicy problems throughout Magma Math are specifically designed to require transfer of conceptual understanding to non-routine contexts. These are not simply harder computations; they are novel situations that demand flexible thinking.

In the Understanding Proportional Relationships pathway (TEKS 6.4.A), Spicy problems compare two growth patterns where one class adds a fixed amount daily and another doubles each day, requiring students to reason about when multiplicative growth overtakes additive growth, a non-routine application of ratio and pattern concepts. In the Percent pathway (TEKS 6.5.B-C), Spicy problems present a multi-step scenario where a student spends 0.6 of a paycheck on rent and 20% on groceries and must determine the fraction remaining for savings, requiring transfer across fraction, decimal, and percent representations in a single problem. In the Statistical Measures pathway (TEKS 6.12.D), Spicy tasks present data in a stem-and-leaf plot and ask students to select the correct five-number summary from multiple options, requiring transfer of statistical computation skills to an unfamiliar display format.

Automaticity and Fluency

Medium problems across all chapters are the primary vehicle for developing student automaticity and fluency with grade-level procedures. Because each subchapter contains multiple problems at the Medium level targeting the same standard, students encounter repeated opportunities to practice key procedures without scaffolding. This structured repetition builds automaticity: students internalize the steps for solving one-step equations, the mechanics of decimal division, or the routine of computing mean and median so that execution becomes reliable and efficient over time. Because Medium problems test the standard as written, they require students to carry out procedures accurately and efficiently using the numbers, expressions, and contexts expected at the grade level.

Efficiency, Flexibility, and Accuracy

Spicy problems provide opportunities for students to evaluate mathematical representations, strategies, and solutions for efficiency, flexibility, and accuracy. Tasks that present equivalent expressions such as (584.12 - 74.25) ÷ 1.3 alongside alternative forms and require students to identify which are equivalent develop the habit of evaluating different computational paths for efficiency: students who recognize structural equivalence complete the task far more efficiently than those who compute each expression. Error analysis tasks, such as problems presenting a student's claim about whether a given value satisfies an equation and asking the student to verify and explain, develop the habit of evaluating solutions for accuracy. And problems that can be approached through multiple valid methods, such as finding a missing angle in a triangle by using either the angle sum property or the exterior angle theorem, build procedural flexibility by requiring students to select, compare, and reason about different strategies rather than relying on a single approach.

Part 6: Process Standards Integration

Overview

The TEKS process standards (b)(1)(A) through (G) are not taught in isolation within Magma Math. They are woven into the content of every learning pathway through the design of the problems themselves. Because Magma Math is a problem-based platform, every student interaction is an opportunity to engage with one or more process standards. The M/M/S scaffolding structure ensures that process standards are engaged at every level of complexity: Mild problems emphasize selecting tools and creating representations (C, E), Medium problems emphasize applying mathematics and communicating ideas (A, D), and Spicy problems emphasize analyzing relationships, justifying reasoning, and evaluating problem-solving processes (B, F, G).

How Process Standards Are Incorporated Throughout Learning Pathways

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

Real-world contexts are embedded across all three M/M/S levels and throughout every strand. At the Mild level, students encounter accessible scenarios such as conversion reference tables showing relationships between feet and inches, pounds and ounces, or liters and milliliters (TEKS 6.4.H). At the Medium level, problems situate equations in realistic contexts: a jug containing a half liter of water and glasses that hold a quarter liter each engages fraction division in a tangible setting (TEKS 6.3.A), and interpreting a table of turn-by-turn point accumulations connects proportional reasoning to a game scenario (TEKS 6.4.A). At the Spicy level, multi-constraint real-world problems bring several skills together, such as determining whether a train can reach a stop 280 miles away at 80 miles per hour in exactly 3.5 hours (TEKS 6.10.B), or calculating what fraction of a paycheck remains after spending portions on rent and groceries expressed in different number forms (TEKS 6.5.B-C). Process standard (A) is embedded most densely in the Proportional Relationships pathway (Chapter 5), the Percent pathway (Chapter 6), and the Linear Equations pathway (Chapter 8), but it appears across every strand.

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

Spicy problems consistently require students to engage the full problem-solving cycle. In the Operations on Integers pathway (TEKS 6.3.C), a Spicy task asks whether it is possible to determine the sign of the sum of two integers by looking at the integers alone, requiring students to analyze cases, formulate a general rule, determine whether the claim holds, and justify their reasoning. In the Geometry pathway (TEKS 6.8.A), Spicy tasks present a triangle with angles expressed as algebraic expressions and ask students to find the measures, requiring them to analyze the angle-sum relationship, formulate the equation, determine the solution, and evaluate whether the result is geometrically valid. In the Linear Equations pathway (TEKS 6.10.B), Spicy tasks embed equation checking in multi-step real-world scenarios where students must analyze the situation, formulate the equation, determine the solution, and justify whether the given value is correct.

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

Mild problems explicitly provide or reference tools for students to use. In the Understanding and Representing Rational Numbers pathway (TEKS 6.2.C), number lines with labeled integers scaffold comparison and ordering tasks. In the Operations on Positive Rational Numbers pathway (TEKS 6.3.A), area model grids and number lines with fraction markings provide visual tools for fraction multiplication and division. In the Converting Units pathway (TEKS 6.4.H), conversion tables listing relationships between units serve as reference tools that students use to execute conversions. As students progress to Medium and Spicy, the explicit tool provision is removed, and students must select appropriate computational strategies, algebraic methods, or graphical approaches independently. In the Expressions pathway, for instance, Spicy problems present a triangle with algebraic side lengths where students must independently recognize that the perimeter formula provides the equation structure needed to find the missing side.

(D) Communicate mathematical ideas using multiple representations

Problems across all levels engage multiple representations: symbolic notation, visual models, tables, graphs, and verbal descriptions. In the Understanding Proportional Relationships pathway (TEKS 6.5.A), Medium tasks require students to read a graph of a proportional relationship and write the equation it represents, translating between graphical and algebraic forms (TEKS 6.6.C). In the Displaying and Interpreting Data pathway (TEKS 6.12.A), Medium tasks require students to interpret data presented in stem-and-leaf plots, box plots, and histograms, translating between visual displays and numerical summaries. In the Percent pathway (TEKS 6.5.C), Spicy tasks require students to move fluidly among fraction, decimal, and percent representations within a single real-world problem, connecting all three forms of the same quantity.

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

Students create their own representations throughout Magma Math. In the Displaying and Interpreting Data pathway (TEKS 6.13.A), Spicy tasks ask students to construct a box plot from a raw data set, requiring them to calculate quartiles and create the graphical display from scratch. In the Linear Equations pathway (TEKS 6.6.B), students create equations from tables of input-output values, organizing the numerical pattern into algebraic form. In the Geometry pathway (TEKS 6.8.C), students write area and volume equations from labeled diagrams, creating symbolic representations that communicate geometric relationships. These tasks go beyond interpreting provided representations; students must organize data, select appropriate formats, and construct displays that communicate mathematical relationships.

(F) Analyze mathematical relationships to connect and communicate

Problems requiring relational analysis appear across all strands. In the Understanding Proportional Relationships pathway (TEKS 6.4.A), Spicy tasks present two growth patterns in side-by-side tables and ask students to analyze when one overtakes the other, requiring analysis of the relationship between additive and multiplicative growth. In the Geometry pathway (TEKS 6.8.A), students analyze the relationship between interior and exterior angles of a triangle, connecting angle measures to the triangle angle-sum property. In the Statistical Measures pathway (TEKS 6.12.B), students analyze the shape of data distributions presented in dot plots, histograms, and stem-and-leaf plots, connecting visual shape to numerical summaries and identifying whether data are symmetric, left-skewed, or right-skewed.

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

Explain and justify prompts appear at every level. At the Mild level, students identify internal and external angles in a triangle diagram with extended sides, requiring precise language about angle classification (TEKS 6.8.A). At the Medium level, problems requiring students to determine whether a given value satisfies an equation engage precise language about equality and substitution (TEKS 6.10.B). At the Spicy level, problems asking whether it is possible to determine the sign of an integer sum without computing require students to construct a mathematical argument about positive and negative number properties (TEKS 6.3.C). Error analysis tasks asking students to verify a peer's claim about an equation's solution and explain their reasoning develop mathematical argumentation across the full range of complexity (TEKS 6.10.B). These tasks develop mathematical argumentation across the full range of complexity.

Process Standards by Chapter

The following table provides an overview of the primary process standards engaged in each learning pathway. All chapters engage process standard (A) through real-world contexts and (D) through multiple representations. The table highlights additional emphasis areas:

Chapter	Primary Process Standards Emphasis
Ch 1: Understanding Rational Numbers	(C) Number lines and bar models as tools for comparison. (F) Analyzing relationships between absolute value, opposites, and position on the number line.
Ch 2: Operations on Positive Rationals	(C) Area models and number lines as tools for fraction operations. (E) Creating visual representations of fraction multiplication and division.
Ch 3: Operations on Integers	(B) Problem-solving models for signed-number reasoning. (G) Explaining and justifying rules for integer operations.
Ch 4: Converting Units	(A) Real-world measurement contexts. (C) Conversion tables as reference tools.

Ch 5: Proportional Relationships	(D) Multiple representations: tables, graphs, equations, verbal descriptions. (F) Analyzing relationships between additive and multiplicative patterns.
Ch 6: Percent	(D) Multiple representations: fractions, decimals, percents, bar models. (A) Real-world contexts: shopping, savings, and finance.
Ch 7: Expressions	(C) Algebra tiles and geometric models as tools. (G) Justifying equivalence of expressions.
Ch 8: Linear Equations/Inequalities	(A) Real-world equation and inequality contexts. (B) Full problem-solving cycle: formulate, solve, check, justify.
Ch 9: Geometry	(E) Creating area and volume equations from diagrams. (F) Analyzing relationships between angles, sides, and measurement formulas.
Ch 10: Displaying Data	(E) Creating box plots, dot plots, and histograms from data. (D) Multiple representations: coordinate planes, statistical displays.
Ch 11: Statistical Measures	(B) Strategic thinking for five-number summaries and outlier identification. (G) Describing and justifying data distribution characteristics.

End of Alignment Guide. Grade 6. Magma Math IMRA Submission.