magma

ALIGNMENT GUIDE

Algebra I

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, course-level mathematical content. The features described below are available across all course 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 course-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 involving exponential growth or systems of equations 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 (coordinate plane graphs, mapping diagrams, tables, scatter plots) 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. In the Algebra I course, these include coordinate plane graphs with labeled intercepts and slopes, mapping diagrams for function identification, scatter plots with lines of best fit, area model diagrams for polynomial multiplication, and graphical representations of exponential growth and decay. 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: Course-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 Algebra I Learning Paths

The Algebra I scope and sequence is organized into three Instructional Strands that reflect the mathematical strands and focal areas defined in the TEKS introduction for high school mathematics (19 TAC §111.39). 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 course 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 Algebra I students experience that story coherently throughout the year.

Strand 1: Linear Functions, Equations, and Inequalities (Chapters 1-4)

Algebra I begins with the study of linear relationships, which form the foundational function family for the entire course. Chapter 1 (Linear Functions and Two-Variable Equations) establishes the core concepts of slope, intercepts, domain, and range through multiple representations: tables, graphs, equations, and verbal descriptions (TEKS A.2.A-F, A.3.A-C, A.3.E). Students build fluency with slope-intercept, point-slope, and standard forms while connecting rate of change to real-world contexts such as direct variation. Chapter 2 (Solving Linear Equations and Inequalities in One Variable) develops algebraic fluency by requiring students to solve equations with variables on both sides and multi-step inequalities (TEKS A.5.A-B). Chapter 3 (Linear Inequalities) extends the graphical and contextual work from Chapter 1 to two-variable inequality constraints (TEKS A.2.H, A.3.D). Chapter 4 (Systems of Linear Equations and Inequalities) synthesizes all prior linear work: students write systems from real-world situations, solve by graphing, substitution, and elimination, and interpret solutions in context (TEKS A.2.I, A.3.F-H, A.5.C). The sequencing ensures that students master single-equation representations and procedures before coordinating multiple relationships simultaneously.

Strand 2: Number and Algebraic Methods (Chapters 5-8)

Once linear fluency is established, Strand 2 broadens students' algebraic toolkit. Chapter 5 (Functions) formalizes the function concept: students distinguish functions from relations using mapping diagrams and the vertical line test, evaluate functions, work with arithmetic and geometric sequences, and manipulate literal equations (TEKS

A.12.A-E). Chapter 6 (Laws of Exponents) builds procedural fluency with exponent rules through numerical and algebraic contexts (TEKS A.11.B). Chapter 7 (Operations on Polynomials) extends arithmetic to polynomial expressions, with adding, subtracting, multiplying, and dividing polynomials (TEKS A.10.A-C). Chapter 8 (Factoring Polynomials) reverses the multiplication process: students factor linear expressions, trinomials of the form x^2+bx+c and ax^2+bx+c, perfect-square trinomials, and differences of squares (TEKS A.10.D-F). This strand intentionally places function formalism before polynomial operations so that students understand why algebraic manipulation matters: it transforms expressions into forms that reveal function behavior.

Strand 3: Non-Linear Functions, Radicals, and Data (Chapters 9-12)

The final strand applies the algebraic methods from Strands 1 and 2 to new function families and data contexts. Chapter 9 (Quadratic Functions and Equations) is the largest chapter in the course: students explore domain and range, graph parabolas, identify axis of symmetry and extrema, write and convert between standard and vertex form, and solve quadratic equations by factoring, completing the square, square roots, and the quadratic formula (TEKS A.6.A-C, A.7.A-C, A.8.A). Chapter 10 (Exponential Functions) introduces growth and decay models, requiring students to construct, evaluate, and graph exponential functions and connect parameters to real-world rates of change (TEKS A.9.A-D, A.12.B). Chapter 11 (Radical Expressions) simplifies square roots and rational exponents, connecting exponent laws from Chapter 6 to a new notational form (TEKS A.11.A-B). Chapter 12 (Formulating Statistical Relationships) grounds the course in data: students calculate and interpret correlation coefficients, distinguish correlation from causation, and fit linear functions to bivariate data sets (TEKS A.4.A-C). The sequencing is intentional: quadratic and exponential work assumes fluency with polynomial operations and factoring from Strand 2, so students' cognitive energy is focused on understanding function behavior, not basic manipulation.

Artifact 2.1: Algebra I Scope and Sequence

Seq	Chapter (Learning Pathway)	Subchapters	Focus TEKS
1	Linear functions and two-variable equations	Direct variation; Domain and range of linear functions; Equations of parallel and perpendicular lines; Graphing linear relationships from slope-intercept form; Graphing linear relationships from various forms; Modeling linear relationships; Slope from equations; Slope from points and graphs; Slope from tables; Transforming linear functions; Writing linear equations from points and slope; Writing linear equations from tables, graphs, and descriptions	A.2.A-F, A.3.A-C, A.3.E

2	Solving linear equations and inequalities in one variable	Equations with variables on both sides; Multistep linear equations; Multi-step inequalities; Solve linear inequalities with variables on both sides	A.5.A-B
3	Linear inequalities	Graphing linear inequalities; Linear inequalities in real-world contexts	A.2.H, A.3.D
4	Systems of linear equations and inequalities	Writing systems of linear equations; Solving systems of equations by graphing; Solving systems of equations by substitution; Solving systems of equations by elimination; Systems of linear inequalities	A.2.I, A.3.F-H, A.5.C
5	Functions	Understanding functions; Evaluating functions; Arithmetic sequence and common difference; Geometric sequences and common ratio; Sequences as functions; Literal equations	A.12.A-E
6	Laws of exponents	Equivalent numerical expressions using laws of exponents; Equivalent expressions using laws of exponents (including multiplication); Equivalent expressions using laws of exponents (including division)	A.11.B
7	Operations on polynomials	Adding polynomials; Subtracting polynomials; Multiplying polynomials; Dividing polynomials	A.10.A-C
8	Factoring polynomials	Factoring linear expressions; Expanding linear expressions; Factoring x^2+bx+c; Factoring ax^2+bx+c; Factoring perfect squares; Factoring difference of squares	A.10.D-F
9	Quadratic functions and equations	Domain and range of quadratic functions (set notation); Writing and converting vertex form of quadratics; Graphing quadratic functions; Intercepts; Axis of symmetry; Minimum and maximum value; Transforming quadratic functions; Solve by factoring; Solve by completing the square; Solving quadratic equations using square roots; The quadratic formula	A.6.A-C, A.7.A-C, A.8.A
10	Exponential functions	Domain and range of exponential functions; Exponential growth and decay; Construct exponential functions; Graphing exponential functions; Evaluate exponential functions	A.9.A-D, A.12.B
11	Radical expressions	Simplifying square roots; Simplifying expressions with rational exponents	A.11.A-B
12	Formulating statistical relationships	Correlation coefficient; Correlation vs. causation; Fit a linear function to data	A.4.A-C

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 have a relationship between mathematical concepts, and the key concepts for each grade level build on previous foundations while preparing students for future learning. Algebra I sits at a pivotal transition in the 3-12 continuum: students "build on Grade 6-8 Mathematics TEKS, which provide a foundation in linear relationships, number and operations, and proportionality" (19 TAC §111.39). Below, we trace five key mathematical strands from Grade 3 through the high school course sequence, with Algebra I 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 Functions

In Grades 3-5, students identify and extend numerical patterns, generate input-output tables, and represent relationships with number pairs and simple expressions (TEKS 3.5, 4.5, 5.4). In Grades 6-7, this work formalizes into constant rates of change, proportional relationships represented as $y = kx$, and generating tables and graphs from equations (TEKS 6.6, 7.4, 7.7). Grade 8 is the critical bridge: students distinguish proportional from non-proportional linear relationships, define slope as a rate of change, write equations in $y = mx + b$ form, and identify functions using tables, graphs, mapping diagrams, and sets of ordered pairs (TEKS 8.4, 8.5). Algebra I then provides a comprehensive study of linear functions: students write equations in multiple forms, graph using slope and intercepts, model real-world situations with two-variable equations, analyze domain and range, explore transformations, and solve systems of linear equations by multiple methods (TEKS A.2, A.3, A.5). Geometry extends this through coordinate proofs involving slope, distance, and midpoint (TEKS G.2). Algebra II builds 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, generate equivalent expressions using properties of operations, and use strip diagrams and equations with letters for unknowns in multistep problems (TEKS 3.5, 4.5, 5.4). Grade 6 formalizes the transition to algebra: students distinguish expressions from equations, write one-variable one-step equations and inequalities, and generate equivalent expressions (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 no solution or infinitely many solutions (TEKS 8.8). Algebra I provides the full algebraic toolkit: students solve multi-step equations and inequalities in one variable, manipulate literal equations, perform operations on polynomials, and factor quadratic and polynomial 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). Precalculus completes the progression with advanced function manipulation and limit concepts.

Quadratic and Non-Linear Functions

In Grade 6, students begin encountering non-linear patterns through tables and sequences that do not maintain a constant difference (TEKS 6.6). Grade 8 introduces the Pythagorean theorem and squared quantities in geometric contexts (TEKS 8.6, 8.7). Algebra I is where non-linear functions receive formal treatment: students study quadratic functions through multiple representations, identify key features such as vertex, axis of symmetry, and intercepts, solve quadratic equations using four methods, and explore exponential growth and decay models (TEKS A.6, A.7, A.8, A.9). This work assumes factoring fluency built across Chapters 6-8. Algebra II expands to all function families: polynomial, rational, radical, exponential, and logarithmic (TEKS A2.2, A2.4-A2.8). Precalculus introduces trigonometric functions, conic sections, and function composition.

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). Grades 6-7 extend the number system to all rational numbers, including negative integers and rational number operations (TEKS 6.2-6.3, 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, evaluate functions at real-valued inputs, and encounter discriminant values that determine whether quadratic solutions are real or complex (TEKS A.10, A.11, A.12.B). Algebra II introduces complex numbers, completing the extension from natural numbers to the full complex number system (TEKS A2.7). Precalculus applies complex numbers in polar and trigonometric form.

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). Grades 6-7 introduce formal statistical measures (mean, median, mode, range, interquartile range, mean absolute deviation) and more complex displays including box plots, histograms, and dot plots with rational values (TEKS 6.12-6.13, 7.6, 7.12). Grade 8 develops bivariate data analysis: students construct scatter plots, describe trend patterns, identify trend lines, and use linear approximations to make predictions (TEKS 8.5, 8.11). Algebra I formalizes this work: students calculate and interpret the correlation coefficient as a measure of linear association strength, distinguish correlation from causation, and write linear regression equations to model bivariate data (TEKS A.4.A-C). Algebra II extends to non-linear regression models and residual analysis (TEKS A2.4). Geometry applies probability in geometric contexts (TEKS G.13).

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 course-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-course-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 course's TEKS.

Level	Characteristics
Mild	Students work on the course-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 course'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 course level, and routine word problems require students to independently determine the appropriate operation or strategy.
Spicy	Students apply the same course-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 course 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 course-level standards. A problem is not made Mild by reverting to middle school content, and a problem is not made Spicy by introducing Algebra II 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 in Algebra I and will encounter in future courses. 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 Course-Level Learning

At the Mild level, problems activate students' prior conceptual understanding from middle school by using familiar models and representations while introducing a new Algebra I concept. In the Systems of Linear Equations pathway (TEKS A.5.C), Mild problems present two lines on a coordinate plane and ask students to identify the intersection point. This directly leverages the Grade 8 understanding of graphing linear equations and identifying solution points (TEKS 8.9), bridging the prior concept of individual linear graphs to the new concept of a system's simultaneous solution. Similarly, in the Exponential Functions pathway (TEKS A.9.C), Mild problems display a curve on a coordinate plane passing through labeled points such as (0, 1), (1, 2), (2, 4), and (3, 8), and ask students to determine the exponential function. The visual representation connects to Grade 8 work with function tables and graphs (TEKS 8.5), ensuring students build new understanding of exponential behavior on a graphical foundation they already possess.

Connecting Prior Procedural Knowledge to Current Course-Level Learning

At the Medium level, students apply and extend procedural skills they developed in earlier grades to perform current course-level tasks. In the Solving Linear Equations pathway (TEKS A.5.A), Medium problems present multi-step equations with variables on both sides and no scaffolding, such as equations requiring distribution and combining like terms before isolating the variable. Students rely on procedural fluency with equation-solving developed across Grades 7 and 8 (TEKS 7.11, 8.8). In the Factoring Polynomials pathway (TEKS A.10.E), Medium problems require students to factor trinomials of the form ax^2+bx+c without GCF hints or visual models. The scaffolding is removed; students must independently select and execute the appropriate factoring strategy, extending the procedural foundation of identifying factors and multiples built across middle school.

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 Quadratic Functions pathway (TEKS A.7.A), Spicy problems require students to determine the equation of a quadratic given constraints on its vertex and a point it passes through, combining graphical reasoning with algebraic manipulation in ways that preview the function analysis demands of Algebra II (TEKS A2.4). In the Exponential Functions pathway (TEKS A.9.B), Spicy problems embed exponential models in multi-step real-world contexts, such as medication decay or investment growth, where students must interpret parameters, evaluate the function, and reason about domain constraints. This multi-constraint reasoning previews the modeling demands of Algebra II and Precalculus. The mathematical content stays within Algebra I, but the strategic complexity builds conceptual habits that future courses require.

Connecting Current Learning to Future Procedural Demands

The progression also prepares students procedurally for future courses. As students move from Mild to Medium within an Algebra I subchapter, they internalize procedures that become prerequisite fluencies in Algebra II and beyond. In the Factoring Polynomials pathway (TEKS A.10.E-F), Medium problems develop fluency with factoring trinomials, perfect squares, and differences of squares. Algebra II assumes this fluency in the context of simplifying rational expressions, solving higher-degree polynomial equations, and analyzing polynomial function behavior (TEKS A2.7). At the Spicy level, problems in the Operations on Polynomials pathway (TEKS A.10.B) require students to multiply and factor in service of a geometric application, such as determining the dimensions of a rectangle given its polynomial area expression. This procedural complexity directly prepares students for the geometric and algebraic synthesis required in Geometry and Algebra II. 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 (5.1b, 5.3b, 5.3c)

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 Algebra I course use a range of visual representations to ground new concepts before students work symbolically. In the Linear Functions pathway (TEKS A.2.A, A.3.C), coordinate plane graphs display line segments with closed and open endpoints, allowing students to read domain and range directly from the visual before encountering interval or set notation. In the Functions pathway (TEKS A.12.A), mapping diagrams with labeled input and output sets illustrate whether a relation qualifies as a function: students see arrows from each input to its output and determine whether any input maps to more than one output. In the Exponential Functions pathway (TEKS A.9.C), graphs show curves passing through labeled coordinate points such as (0, 1), (1, 2), (2, 4), and (3, 8), making the multiplicative pattern visible before students write the symbolic rule. In the Formulating Statistical Relationships pathway (TEKS A.4.C), scatter plots display data points with a trend line, allowing students to observe the direction and strength of a linear relationship before computing the regression equation.

Transition to abstract models. Medium problems remove these visual supports and require students to work with symbolic and algorithmic representations. Solving multi-step equations with variables on both sides appears without first-step hints. Factoring trinomials requires pattern recognition without GCF scaffolding. Domain and range questions present functions in algebraic form rather than graphical form. 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, 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 Functions pathway (TEKS A.12.A), Spicy tasks present a real-world growth scenario, such as a beehive population that doubles weekly, and ask students to complete a table and plot values on a coordinate plane, requiring them to construct both tabular and graphical representations and connect both to the exponential model. In the Quadratic Functions pathway (TEKS A.7.A), students work between vertex form and graphical features, constructing the connection between algebraic parameters and visual attributes of the parabola. In the Formulating

Statistical Relationships pathway (TEKS A.4.C), students create linear regression models from raw data tables and interpret slope and intercept in real-world contexts, defining what each parameter means. 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 (5.1a)

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.

At the Mild level, interpretation is the primary cognitive demand. Students examine the graph of f(x) = 2^x on a coordinate plane and identify its domain or range from the visual, interpret a mapping diagram to determine whether a relation is a function, or read a scatter plot to identify the general direction of a trend. These tasks activate comprehension before computation.

At the Medium level, analysis takes center stage. Determining the range of g(x) = 2^(x+1) requires analyzing how the transformation affects the parent function's output values without a graph provided. Evaluating a function at a specific input from a table of values requires analyzing the tabular structure to locate the relevant ordered pair. Factoring $4x^2 - 6x + 2$ requires analyzing the coefficient structure to select the appropriate factoring strategy.

At the Spicy level, evaluation is foregrounded. Tasks ask students to evaluate whether the range of any exponential function of the form g(x) = a^x (where a > 1) is always all real numbers, requiring conceptual judgment about function behavior. Error analysis problems present a student's incorrect solution to a linear equation and ask students to identify the mistake and correct it. Multi-constraint problems in the statistical relationships pathway require students to evaluate competing regression models and determine which best fits a data set. These problems demand judgment, not just execution.

Applying Conceptual Understanding to New Situations (5.1c)

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 Exponential Functions pathway (TEKS A.9.C), Spicy problems embed function construction in real-world decay scenarios: a road safety plan proposes reducing driving accidents by 15% every 2 years, and students must determine which function model correctly captures the biennial decay rate. Students cannot simply apply a memorized formula; they must reason about what a 15% reduction means multiplicatively and how the 2-year period translates into the exponent's structure. In the Quadratic Functions pathway (TEKS A.8.A), Spicy problems require students to complete the square to convert between forms of a quadratic expression, then interpret the vertex in a real-world optimization context. In the Formulating Statistical Relationships pathway (TEKS A.4.C), Spicy tasks present raw data on average US house prices across decades and require students to write a linear regression equation, interpret its slope as an annual rate of change in dollars, and evaluate whether a linear model is appropriate for the data's time span.

Automaticity, Fluency, and Efficiency (5.2a, 5.2c)

Medium problems across all chapters are the primary vehicle for developing student automaticity and fluency with course-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 equations with variables on both sides, the mechanics of polynomial multiplication, or the routine of factoring trinomials 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 expressions, equations, and contexts expected at the course level.

Spicy problems then provide opportunities for students to evaluate mathematical representations, strategies, and solutions for efficiency, flexibility, and accuracy. Tasks that present a complex factoring problem such as $50x^2 - 162$ and require students to recognize the structure as a difference of squares after extracting a GCF develop the habit of evaluating different computational paths for efficiency: students who recognize $2(25x^2 - 81) = 2(5x - 9)(5x + 9)$ complete the task far more efficiently than those who attempt trial-and-error factoring. Error analysis tasks, where a student must identify a peer's incorrect solution to a linear equation and explain the flaw, develop the habit of evaluating solutions for accuracy. And problems that can be approached through multiple valid methods, such as solving a quadratic by factoring, completing the square, or the quadratic formula, 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 identifying direct variation in a grape-purchasing context where total cost varies proportionally with pounds purchased (TEKS A.2.D). At the Medium level, problems situate equations in realistic contexts: determining how many pounds of watermelon can be purchased with a given budget engages linear reasoning (TEKS A.2.D), and evaluating a house's value after 10 years using an exponential function connects algebra to financial modeling (TEKS A.12.B). At the Spicy level, multi-constraint real-world problems bring several skills together, such as modeling a road safety plan's accident reduction with an exponential decay function where the decay rate applies biennially (TEKS A.9.C), or interpreting a medication's half-life to determine remaining dosage after a specified number of hours (TEKS A.12.B). Process standard (A) is embedded most densely in the Exponential Functions pathway (Chapter 10) and the Formulating Statistical Relationships pathway (Chapter 12), 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 Solving Linear Equations pathway (TEKS A.5.A), a Spicy task presents a student's incorrect solution to a multi-step equation and asks the student to analyze the error, formulate the correct approach, determine the right answer, and justify why the original solution was wrong. In the Quadratic Functions pathway (TEKS A.8.A), Spicy tasks require students to analyze a quadratic equation's structure, formulate which solution method is most efficient, determine the solution, and evaluate whether the answer is consistent with the function's graph. In the Systems pathway (TEKS A.5.C), Spicy tasks embed systems in multi-step real-world scenarios where students must analyze competing constraints, formulate the system of equations, determine the solution, and evaluate its reasonableness in context.

(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 Linear Functions pathway (TEKS A.2.A), coordinate plane graphs with labeled endpoints scaffold domain and range identification. In the Functions pathway (TEKS A.12.A), mapping diagrams provide a visual tool for determining whether a relation is a function. In the Exponential Functions pathway (TEKS A.9.D), blank coordinate grids accompany graphing tasks, providing the tool context for students to sketch curves. As students progress to Medium and Spicy, the explicit tool provision is removed, and students must select appropriate algebraic strategies, graphical methods, or computational approaches independently. In the Factoring pathway, for instance, Spicy problems present expressions like $50x^2 - 162$ where students must independently recognize that extracting a GCF first makes the difference-of-squares pattern visible.

(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 Linear Functions pathway (TEKS A.2.C, A.3.C), Medium tasks require students to translate between a verbal real-world description, a table of values, and a linear equation, writing the equation from multiple starting points. In the Quadratic Functions pathway (TEKS A.6.B, A.7.A), Medium tasks require converting between standard and vertex form and interpreting the graphical implications of each. In the Exponential Functions pathway (TEKS A.9.B), Spicy tasks present data in a table of x and y values and ask students to identify the growth or decay factor, connecting tabular, numeric, and algebraic representations of the same exponential relationship.

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

Students create their own representations throughout Magma Math. In the Functions pathway (TEKS A.12.A), Spicy tasks ask students to complete a table showing a beehive's doubling population and then plot those values on a coordinate plane, creating both tabular and graphical representations from a verbal description. In the Formulating Statistical Relationships pathway (TEKS A.4.C), students construct scatter plots from raw data tables and then create linear regression equations to model the trend. In the Linear Inequalities pathway (TEKS A.3.D), students create graphical representations of two-variable inequality solution sets by shading appropriate regions. 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 Linear Functions pathway (TEKS A.2.E, A.2.F), Spicy tasks present a line on a coordinate plane and ask students to determine the equation of a parallel or perpendicular line through a given point, requiring analysis of the relationship between slopes. In the Exponential Functions pathway (TEKS A.9.B), students analyze a table of values to determine whether data represents exponential growth or decay and to identify the common ratio, connecting numerical patterns to the algebraic model. In the Quadratic Functions pathway (TEKS A.7.C), students analyze how changes to parameters in vertex form affect the shape, position, and orientation of a parabola, connecting algebraic transformations to graphical behavior.

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

Explain and justify prompts appear at every level. At the Mild level, true-or-false tasks about function properties, such as whether the graph of $f(x) = 3^x$ passes through (0, 1), require students to articulate their reasoning even on accessible problems (TEKS A.12.B). At the Medium level, problems requiring students to determine the range of a transformed exponential function engage precise language about asymptotic behavior and output values (TEKS A.9.A). At the Spicy level, error analysis tasks present a peer's incorrect equation-solving work and ask students to identify the flawed step, select the correct procedure, and explain why the original approach produced the wrong answer (TEKS A.5.A). Spicy problems asking whether a given statement about exponential function behavior is always true require students to construct a mathematical argument using precise language about domain, range, and end behavior. 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: Linear Functions	(D) Multiple representations: tables, graphs, equations, verbal descriptions. (F) Analyzing relationships between slope, intercepts, and function behavior.
Ch 2: Solving Equations/Inequalities	(B) Problem-solving models for multi-step equation solving. (G) Explaining and justifying solution steps.
Ch 3: Linear Inequalities	(A) Real-world inequality constraints. (E) Creating graphical representations of solution regions.
Ch 4: Systems	(A) Real-world application with competing constraints. (B) Full problem-solving cycle: analyze, formulate, solve, justify.

Ch 5: Functions	(D) Multiple representations: mapping diagrams, tables, graphs, equations. (F) Analyzing relationships between input-output behavior and function definitions.
Ch 6: Laws of Exponents	(C) Selecting appropriate exponent rules. (G) Justifying equivalence of expressions.
Ch 7: Operations on Polynomials	(B) Strategic planning for multi-step polynomial operations. (E) Creating equivalent polynomial forms.
Ch 8: Factoring Polynomials	(C) Selecting appropriate factoring strategies. (G) Explaining and justifying factored forms.
Ch 9: Quadratic Functions/Equations	(B) Full problem-solving cycle across four solution methods. (D) Multiple representations: vertex form, standard form, graphs, tables.
Ch 10: Exponential Functions	(A) Real-world growth and decay modeling. (F) Analyzing relationships between parameters and function behavior.
Ch 11: Radical Expressions	(C) Selecting between radical and rational exponent notation. (G) Justifying simplified forms.
Ch 12: Statistical Relationships	(A) Real-world data analysis contexts. (E) Creating scatter plots, regression models, and data displays.

End of Alignment Guide. Algebra I. Magma Math IMRA Submission.