magma

ALIGNMENT GUIDE

Grade 3

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, arrays of objects, fraction bars, shaded area models, partitioned shapes, bar graphs, pictographs, analog clocks, and vertical addition and subtraction layouts) 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, arrays of objects, fraction bars, shaded area models, partitioned shapes, bar graphs, pictographs, analog clocks, and vertical addition and subtraction layouts. 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 3 Learning Paths

The Grade 3 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 and Operations (Chapters 1-5)

Grade 3 opens by deepening students' understanding of the base-ten number system. Chapter 1 (Understanding whole numbers and place value) extends Grade 2 work with three-digit numbers to reading, writing, comparing, and ordering numbers through 99,999, and introduces rounding and estimation (TEKS 3.2.A-D, 3.4.B). Chapters 2 and 3 (Addition and subtraction of whole numbers; Multiplication) then develop fluency with multi-digit addition and subtraction with regrouping and introduce multiplication through arrays, equal groups, and facts through 10×10 (TEKS 3.4.A, 3.4.D-G, 3.5.A-C). Chapter 4 (Division) builds directly on the multiplication fluency from Chapter 3, requiring students to divide using facts through 10, understand division as separation, identify even and odd numbers, and connect multiplication and division as inverse operations (TEKS 3.4.F, 3.4.H-J, 3.5.B). Chapter 5 (Solving problems involving whole numbers) synthesizes all four operations in multistep word problems, unknown-value equations, real-world relationships, and money contexts (TEKS 3.4.C, 3.4.K, 3.5.B, 3.5.D-E). This strand ensures students develop a unified understanding of whole-number operations before applying those skills in more complex contexts.

Strand 2: Fractions and Measurement (Chapters 6-9)

Once operational fluency is established, the focus shifts to fractional reasoning and measurement. Chapter 6 (Representing and explaining fractional units) formalizes fraction concepts through area models, fraction bars, number lines, decomposition, comparison, equivalence, and fair-share problems (TEKS 3.3.A-H, 3.7.A). Chapter 7 (Area and perimeter) extends the partitioning reasoning from fractions into geometric measurement, requiring students to compute area of rectangles and rectilinear figures and perimeter of polygons (TEKS 3.6.C-E, 3.7.B). For example, area tasks in Chapter 7 assume the multiplicative thinking built in Chapters 3-4, so students can focus their cognitive energy on understanding geometric relationships rather than basic computation. Chapter 8 (2D and 3D figures) develops classification of two-dimensional and three-dimensional figures and attributes of quadrilaterals (TEKS 3.6.A-B). Chapter 9 (Time, weight, and volume) rounds out the strand with elapsed time in minutes and selecting appropriate measuring tools (TEKS 3.7.C-D).

Strand 3: Data Analysis (Chapter 10)

The final strand applies the number sense and representational fluency from Strands 1 and 2 to data contexts. Chapter 10 (Displaying and interpreting data) requires students to construct and interpret bar graphs with multi-unit scales, pictographs, line plots, and frequency tables (TEKS 3.8.A-B). These tasks draw on multiplication (to interpret multi-unit scales) and comparison (to draw conclusions), connecting data analysis back to the operations and fraction work from earlier strands. Data problems in Chapter 10 assume the computational fluency from Strand 1 and the representational skills from Strand 2.

Grade 3 Scope and Sequence

The table below presents the recommended instructional sequence for Grade 3. Chapters are ordered so that foundational concepts support later learning: place value precedes multi-digit computation, multiplication precedes division, and fraction concepts precede area measurement. Teachers may adjust pacing to meet classroom needs while preserving the logical dependencies between chapters.

Seq	Chapter (Learning Pathway)	Subchapters	Focus TEKS
1	Understanding whole numbers and place value	Number lines (4- and 5-digit); comparing; rounding; estimating sums and differences; relationship between digits	3.2.A-D, 3.4.B
2	Addition and subtraction of whole numbers	Adding/subtracting 2- and 3-digit numbers; adding tens, 10s, and 100s; multi-step word problems	3.4.A, 3.5.A
3	Multiplication	Arrays; equal groups; multiplication facts 1-10; multiplying 2-digit by 1-digit; multiples of 10; comparisons; squaring	3.4.D-G, 3.5.B-C
4	Division	Division facts 1-10; division as separation; even/odd;	3.4.F, 3.4.H-J, 3.5.B

		relationship between multiplication and division	
5	Solving problems involving whole numbers	Multiplication and division word problems; unknowns; two-step problems; real-world relationships; values of coins and bills	3.4.C, 3.4.K, 3.5.B, 3.5.D-E
6	Representing and explaining fractional units	Fractions from figures; unit fractions; representing, decomposing, comparing fractions; equivalent fractions; fair share; number lines	3.3.A-H, 3.7.A
7	Area and perimeter	Area of rectangles and rectilinear figures; partitions of shapes; perimeter of polygons	3.6.C-E, 3.7.B
8	2D and 3D figures	Classifying 2D figures; identifying 3D figures; attributes of quadrilaterals	3.6.A-B
9	Time, weight, and volume	Elapsed time in minutes; selecting appropriate measuring tools	3.7.C-D
10	Displaying and interpreting data	Bar graphs; pictographs; line plots; tables and frequency tables	3.8.A-B

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 3 sits near the midpoint of the K-6 continuum: it assumes concrete experiences with counting, place value, basic addition and subtraction, and informal partitioning from K-2 and prepares students for multi-digit computation, fraction operations, and formal geometric measurement in Grades 4 through 6. Below, we trace six key mathematical strands from Kindergarten through Grade 6, with Grade 3 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 3 identifies primary focal areas including the four operations on whole numbers (with emphasis on multiplication and division), the meaning of fractions, and the application of measurement concepts including area and perimeter. 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 develop number sense by counting, composing, and decomposing quantities within 120. Grade 2 extends this to three-digit numbers with an emphasis on the base-ten structure. In Grade 3, Magma Math's place value chapter advances students to reading, writing, comparing, and ordering numbers through 99,999, and introduces rounding to the nearest ten and hundred as a tool for estimation (3.2.A-D, 3.4.B). This progression continues into Grade 4, where students work with numbers to the hundred-thousands and apply rounding to larger values, and into Grades 5 and 6, where decimal place value and the full rational-number system become central.

Fractions and Rational Numbers

Early fraction concepts begin in Grades 1 and 2, where students partition shapes into equal parts and use informal language to describe halves, fourths, and eighths. Grade 3 formalizes this work: students represent fractions using area models, fraction bars, and number lines; decompose fractions into unit fractions; compare fractions with like numerators or denominators; and identify equivalent fractions (3.3.A-H, 3.7.A). Magma Math's fraction chapter provides the visual scaffolding that makes this formal transition accessible. In Grade 4, students extend to addition and subtraction of fractions with like denominators and relate fractions to decimals. By Grades 5 and 6, students operate on fractions with unlike denominators and apply fraction reasoning to ratios and proportional relationships.

Operations

Addition and subtraction develop across Kindergarten through Grade 2, culminating in fluent computation within 1,000 by the end of Grade 2. Grade 3 solidifies this fluency by extending addition and subtraction to problems that involve regrouping across multiple place values and by embedding these operations in multistep contexts (3.4.A, 3.5.A). Simultaneously, Grade 3 introduces multiplication and division as new operations grounded in arrays, equal groups, and the relationship between the two operations (3.4.D-J, 3.5.B-C). Magma Math's multiplication and division chapters scaffold these concepts from concrete grouping models through fact fluency and into procedural application. In Grade 4, students multiply up to four digits by one digit and divide with two-digit dividends; by Grades 5 and 6, students compute with multi-digit whole numbers, decimals, and fractions, building on the operational foundation laid in Grade 3.

Algebraic Reasoning

Algebraic thinking in the early grades focuses on patterns, properties of operations, and the relationship between equations and real-world situations. In Grades 1 and 2, students use the relationship between addition and subtraction to solve for unknowns. Grade 3 extends this reasoning to multiplication and division: students determine unknown values in equations such as a missing factor or dividend and describe real-world relationships using all four operations (3.5.D-E). Magma Math's problem-solving chapter engages students in these tasks across all M/M/S levels, with Spicy problems requiring students to synthesize multiple constraints. In Grades 4 and 5, algebraic reasoning expands to include expressions, equations with variables, and input-output relationships, and by Grade 6 students formalize these ideas through one-variable equations and inequalities.

Geometry and Measurement

Geometric reasoning progresses from recognizing and naming shapes in Kindergarten to classifying shapes by attributes in Grades 2 and 3. In Grade 3, students distinguish among quadrilaterals, identify attributes of two-dimensional and three-dimensional figures, and connect geometry to measurement by computing area and perimeter (3.6.A-E, 3.7.B). The area work is particularly significant: it links geometric partitioning to multiplication, reinforcing the cross-strand coherence described in Part 2. In Grade 4, students measure angles and classify triangles; by Grades 5 and 6, students compute volumes of rectangular prisms and use coordinate geometry, building directly on the spatial reasoning and measurement concepts introduced in Grade 3.

Data Analysis

Data representation begins in Kindergarten with sorting and classifying objects, and Grades 1 and 2 introduce picture graphs and bar graphs with single-unit scales. Grade 3 advances this strand by requiring students to construct and interpret bar graphs with multi-unit scales, pictographs, line plots, and frequency tables (3.8.A-B). These tasks demand that students apply multiplication (to interpret multi-unit scales) and comparison (to draw conclusions from data), connecting data analysis back to the operations strand. In Grades 4 and 5, students work with dot plots, stem-and-leaf plots, and scatterplots, and by Grade 6 students analyze data distributions and measures of center, extending the representational and interpretive skills built in Grade 3.

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 Grade 3 activate conceptual knowledge that students built in Grades K-2. In the multiplication chapter, Mild tasks present arrays of objects and ask students to count the total, connecting the Grade 2 concept of repeated addition to the new concept of multiplication as equal groups (3.4.D). A Mild problem in this subchapter might show an image of four rows of three apples and ask how many apples there are, providing the visual structure that bridges additive thinking to multiplicative thinking. Similarly, in the fractions chapter, Mild problems present shaded area models and ask students to identify the fraction represented (3.3.A), activating the informal partitioning experiences from Grade 2 in which students divided shapes into halves and fourths. By grounding entry-level tasks in familiar visual representations and prior conceptual understanding, the Mild level ensures that students begin each new topic with a secure foundation rather than an abrupt conceptual leap.

Connecting Prior Procedural Knowledge to Current Grade-Level Learning

Medium problems connect the procedural fluencies developed in earlier grades to the full demands of the Grade 3 standards. In the addition and subtraction chapter, Medium tasks require students to add and subtract three-digit numbers with regrouping and no scaffolding (3.4.A, 3.5.A), building directly on the two-digit computation procedures mastered in Grade 2. A Medium problem might present a multi-step word problem in which students must determine the correct operations and execute them with numbers that require regrouping across place values. In the division chapter, Medium problems ask students to recall basic division facts without visual support (3.4.F, 3.4.H), extending the inverse-operation reasoning students practiced with addition and subtraction fact families in Grade 2. The removal of scaffolding at the Medium level is deliberate: it reveals whether students can independently apply prior procedural knowledge to the increased complexity of Grade 3 standards.

Connecting Current Learning to Future Conceptual Demands

Spicy problems in Grade 3 foreshadow the conceptual demands students will encounter in Grades 4 through 6. In the fractions chapter, Spicy tasks require students to compare fractions and apply equivalent fraction reasoning in multi-step contexts (3.3.F-H), preparing them for the fraction operations and decimal connections that define Grade 4 mathematics. A Spicy problem might present a real-world scenario in which a farmer's animals are described using multiple fractions with different denominators, requiring students to reason about equivalent parts and compute a remaining quantity. This kind of synthesis foreshadows the fraction addition and subtraction with unlike denominators that students will formalize in Grade 5. In the geometry chapter, Spicy tasks ask students to analyze composite figures and reason about attributes of quadrilaterals using conditional logic (3.6.B), building toward the more formal geometric classification and angle measurement of Grade 4.

Connecting Current Learning to Future Procedural Demands

Medium problems in Grade 3 also establish procedural fluencies that become prerequisites for future grades. Multiplication fact fluency, practiced extensively through Medium tasks across the multiplication and division chapters (3.4.F, 3.5.B), is the procedural bedrock on which Grade 4's multi-digit multiplication and long division algorithms depend. Students who achieve automaticity with single-digit multiplication facts in Grade 3 can devote cognitive resources to learning new procedures rather than recalculating basic facts. Likewise, Medium problems in the area chapter require students to compute area by multiplying side lengths without grid support (3.6.C), a procedure that Grade 4 extends to larger dimensions and that Grade 5 transforms into volume computation with three dimensions. The deliberate focus on fluency without scaffolding at the Medium level ensures that these foundational procedures transfer forward as automatic tools rather than fragile, context-dependent skills.

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 structures Grade 3 content along a concrete-representational-abstract (CRA) progression that is embedded in the M/M/S scaffolding framework. At the Mild level, problems rely on concrete and pictorial representations to make abstract concepts visible. In the multiplication chapter, Mild tasks display arrays of objects, such as rows of bananas or grids of apples, so that students can see the equal-group structure before they write a multiplication expression. In the fractions chapter, Mild problems present shaded fraction bars and partitioned shapes that students use to identify and name fractional quantities. These visual supports scaffold the transition from physical manipulation to symbolic reasoning.

At the Medium level, visual scaffolding is removed and students work with the abstract notation expected by the standard. A Medium multiplication problem presents a bare equation such as a two-digit by one-digit product with regrouping, and a Medium fraction problem asks students to compare fractions given only symbolic notation and a real-world context. The progression from concrete to abstract is deliberate: students connect the pictorial models they explored at the Mild level to the symbolic procedures they execute at Medium, and they carry both understandings into the Spicy level, where non-routine task structures demand that students move flexibly between representations.

Across this progression, Magma Math supports students in connecting concrete models to abstract concepts by pairing visual representations with symbolic notation at the Mild level, creating pictorial representations when problems ask students to construct area models or partition shapes, defining mathematical terms through precise visual referents (a fraction bar that shows exactly what one-fourth means), and explaining their reasoning when Spicy tasks require students to justify a comparison or identify an error. These four dimensions, connecting, creating, defining, and explaining, are woven throughout the learning pathways.

Interpret, Analyze, and Evaluate

Interpret

Mild problems require students to interpret mathematical concepts and real-world situations by reading visual models and extracting meaning. In the data chapter, a Mild task presents a frequency table showing favorite colors and asks students to identify the most popular choice, requiring students to interpret the data representation and translate visual information into a numerical answer (TEKS 3.8.A). In the time chapter, Mild problems display two analog clocks and ask students to determine the start time, requiring interpretation of the clock model as a measurement tool (TEKS 3.7.C). 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 the addition and subtraction chapter, a Medium word problem presents a multi-step scenario involving purchases and change, requiring students to analyze which operations apply and in what order (TEKS 3.4.A, 3.5.A). In the fractions chapter, a Medium problem presents a real-world comparison of two fractional quantities and asks students to determine which is greater, requiring analysis of fraction magnitude without pictorial support (TEKS 3.3.H).

Evaluate

Spicy problems require students to evaluate mathematical reasoning, strategies, and solutions. In the geometry chapter, a Spicy task presents a set of statements about the properties of a quadrilateral and asks students to determine which statements are necessarily true and explain why a classmate's reasoning is incorrect, requiring evaluation of multiple claims against geometric definitions (TEKS 3.6.B). In the addition and subtraction chapter, a Spicy problem provides building heights in a table and asks students to evaluate which computation yields the correct difference, requiring them to select relevant information from a data display and assess the reasonableness of their answer (TEKS 3.4.A, 3.5.A).

Apply to New Situations

Spicy problems across all chapters provide opportunities for students to apply conceptual understanding to new and non-routine contexts. In the division chapter, a Spicy problem describes a student who has candies, eats some, and then shares the remainder equally, requiring students to chain two operations (subtraction and division) in a context that does not signal the procedure (3.4.H, 3.5.B). In the area chapter, a Spicy task presents a real-world flag and asks students to determine what fraction of the total area is a particular color, synthesizing fraction reasoning with area partitioning in a novel context (3.6.E). These transfer problems ensure that students move beyond routine application and demonstrate the flexible conceptual understanding that characterizes deep mathematical learning.

Automaticity and Fluency

Medium problems serve as the primary vehicle for developing automaticity and fluency in Grade 3. In the multiplication chapter, Medium tasks present basic fact equations without visual support, requiring students to recall products through structured repetition across all single-digit factors (3.4.F, 3.5.B). The same structure appears in the division chapter, where Medium problems require automatic recall of quotients. This repetition is not rote drill; it is embedded within the M/M/S progression so that students practice facts only after the Mild level has established the conceptual meaning of each operation. The result is fluency that is procedurally efficient and conceptually grounded, enabling students to carry out multiplication and division procedures flexibly, accurately, and efficiently as they move to more complex tasks within Grade 3 and into Grade 4.

Efficiency, Flexibility, and Accuracy

Magma Math provides opportunities for students to evaluate representations, models, strategies, and solutions for efficiency, flexibility, and accuracy across Grade 3 content. Efficiency appears when Spicy addition problems ask students to arrange and compare sums of multiple addends, encouraging them to identify computational shortcuts such as grouping compatible numbers (3.4.A). Flexibility is evident in the multiplication chapter, where problems can be solved using arrays, repeated addition, or skip counting, and Spicy tasks present contexts that reward choosing the most effective strategy (3.4.D-E). Accuracy is developed through error-analysis tasks in the geometry and quadrilateral subchapters, where Spicy problems present an incorrect claim about a shape's properties and ask students to identify the specific error and justify the correct classification (3.6.B). Together, these three dimensions ensure that Grade 3 students develop not just the ability to compute, but the mathematical judgment to compute well.

Part 6: Process Standards Integration

Overview

The TEKS process standards (A) through (G) are integrated across all Grade 3 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 (C) selecting tools and techniques and (D) communicating mathematical ideas using multiple representations, 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 (B) using a problem-solving model, (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 Multiplication (TEKS 3.4.D), a task presents arrays of everyday objects, such as rows of bananas, so that students see multiplication as a tool for counting grouped items in a familiar context. At the Medium level, in Addition and subtraction of whole numbers (TEKS 3.4.A, 3.5.A), a problem embeds computation in a word problem about purchases and savings, such as a student calculating how much money remains after buying two items. At the Spicy level, in Solving problems involving whole numbers (TEKS 3.4.K, 3.5.B), a problem presents a multi-step scenario, such as dividing students among sports teams and computing total team sizes, requiring students to chain operations within realistic constraints. 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 Representing and explaining fractional units (TEKS 3.3.A), a task presents shaded area models alongside symbolic fraction notation, providing a concrete model that directly represents the mathematical concept and guiding students through the first step of analysis. At the Medium level, in Addition and subtraction of whole numbers (TEKS 3.5.A), a multi-step word problem requires students to determine which operations apply and in what order without scaffolding, engaging the formulate-and-determine phases of the problem-solving model. At the Spicy level, in Representing and explaining fractional units (TEKS 3.3.F-H), a problem describes a farmer's animals using multiple fractions with different denominators, requiring students to formulate a plan for finding a remaining quantity and justify their answer through equivalent-fraction reasoning. This progression ensures that students develop the full problem-solving cycle across increasing complexity.

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

At the Mild level, in Understanding whole numbers and place value (TEKS 3.2.C), problems present number lines as tools for locating and comparing numbers, making the tool selection explicit. At the Medium level, in the same pathway (TEKS 3.4.B), students use estimation and rounding as techniques for checking computational reasonableness, choosing the appropriate technique independently. At the Spicy level, in Area and perimeter (TEKS 3.6.C-D), a problem requires students to select between counting grid squares and multiplying side lengths, encouraging strategic tool selection based on the problem's structure. 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 Representing and explaining fractional units (TEKS 3.3.A-B), students represent fractions using area models, fraction bars, and number lines, communicating the same value through multiple visual formats. At the Medium level, in Displaying and interpreting data (TEKS 3.8.A-B), students move between tables, bar graphs, and pictographs to communicate the same data set in multiple formats without scaffolding. At the Spicy level, in 2D and 3D figures (TEKS 3.6.B), students communicate their reasoning using both attribute language and diagrams when justifying quadrilateral classifications, requiring multi-representational reasoning. 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 Displaying and interpreting data (TEKS 3.8.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 3.8.A), students are given a frequency table and must create a pictograph or bar graph from the data, building the representation themselves. At the Spicy level, in Area and perimeter (TEKS 3.6.D-E), students create partitioned models of rectilinear figures to determine area, constructing the entire representation from scratch before computing. 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 Multiplication (TEKS 3.4.D-E), a task presents arrays and equal groups, making the relationship between repeated addition and multiplication explicit through visual arrangement. At the Medium level, in Division (TEKS 3.4.J), students identify the relationship between multiplication and division as inverse operations, analyzing multiplicative structure. At the Spicy level, in Solving problems involving whole numbers

(TEKS 3.5.D), a problem presents equations with unknown values and asks students to determine the missing factor or dividend, requiring them to analyze and connect multiple operational 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 and 3D figures (TEKS 3.6.A), students are shown a set of shapes and asked to identify which figure matches a given name, justifying their choice by analyzing each shape's attributes against the definition. At the Medium level, in Representing and explaining fractional units (TEKS 3.3.H), a problem asks students to compare two fractions with like denominators and determine which is greater, requiring them to explain the comparison using mathematical language about parts and wholes. At the Spicy level, in 2D and 3D figures (TEKS 3.6.B), students are told that a classmate claims certain statements describe a square, but the classmate is incorrect; students must select the statements that are necessarily true, 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

The following table summarizes the primary process standards emphasis for each Grade 3 chapter. All chapters integrate multiple process standards; the table highlights the standards that are most prominent in each learning pathway.

Chapter	Primary Process Standards Emphasis
Ch 1: Understanding whole numbers and place value	(C) Tool selection: number lines and place-value charts for locating and comparing numbers; (D) Multiple representations: expanded form, standard form, word form; (E) Estimation: rounding whole numbers to benchmark values
Ch 2: Addition and subtraction of whole numbers	(A) Problem solving: multi-step word problems with addition and subtraction; (B) Models: vertical algorithms and number lines for regrouping; (D) Multiple representations: tables, word problems, and equations
Ch 3: Multiplication	(A) Problem solving: real-world equal-group and array contexts; (D) Multiple representations: arrays, repeated addition, and equations; (E) Creating representations: building array models from word problems
Ch 4: Division	(A) Problem solving: equal-sharing and grouping contexts; (F) Relationships: connecting multiplication and division as inverse operations; (B) Problem-solving model: using related multiplication facts to determine quotients
Ch 5: Solving problems involving whole numbers	(A) Problem solving: multi-step word problems with all four operations; (B) Problem-solving model: analyzing given information to determine operations and sequence; (F)

	Relationships: connecting operations to real-world relationships and unknowns
Ch 6: Representing and explaining fractional units	(D) Multiple representations: area models, fraction bars, and number lines for the same fraction; (E) Creating representations: partitioning and shading models; (G) Justification: comparing fractions using mathematical reasoning
Ch 7: Area and perimeter	(C) Tool selection: grids vs. multiplication for computing area; (E) Creating representations: partitioned models of rectilinear figures; (F) Relationships: connecting area formulas to multiplication
Ch 8: 2D and 3D figures	(D) Multiple representations: visual classification of figures by attributes; (G) Justification: verifying quadrilateral classifications against definitions; (F) Relationships: recognizing hierarchical relationships among shapes
Ch 9: Time, weight, and volume	(C) Tool selection: analog clocks and measurement instruments; (A) Problem solving: elapsed time in real-world contexts
Ch 10: Displaying and interpreting data	(A) Problem solving: one- and two-step problems using data from graphs and tables; (D) Multiple representations: bar graphs, pictographs, line plots, and frequency tables; (E) Creating representations: constructing data displays from tables

End of Alignment Guide. Grade 3. Magma Math IMRA Submission.