magma

ALIGNMENT GUIDE

Grade 2

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 (base-ten blocks, number lines, place value charts, shaded shapes, partitioned circles and rectangles, polygon outlines, unit square grids, rulers, coin images, arrays of grouped objects, bar graphs, pictographs, and analog and digital clocks) 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 base-ten blocks, number lines, place value charts, shaded shapes, partitioned circles and rectangles, polygon outlines, unit square grids, rulers, coin images, arrays of grouped objects, bar graphs, pictographs, and analog and digital clocks. 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 2 Learning Paths

The Grade 2 scope and sequence is organized into three Instructional Strands designed to build conceptual understanding before application. The strands connect patterns, big ideas, and relationships within the grade so that students see later topics as extensions of earlier ones rather than isolated skills. Mathematics at this grade level tells a continuous, connected story in which TEKS within the same strand in a specific grade level relate to the same big idea, while TEKS across strands can also connect in a variety of ways.

Strand 1: Number Sense and Operations (Chapters 1-7)

Grade 2 opens by extending students' understanding of the base-ten number system. Chapter 1 (Representing and comparing whole numbers) builds on Grade 1 work with two-digit numbers by expanding the range to 1,200, developing place value understanding through hundreds, and introducing comparison on the number line (TEKS 2.2.A-B, 2.2.D-F, 2.9.C). Chapter 2 (Recognize fractional units) introduces the concept of equal parts by partitioning shapes into halves and fourths, laying foundational understanding before formal fraction notation in Grade 3 (TEKS 2.3.A, 2.3.D). Chapters 3 and 4 (Adding and subtracting two-digit numbers; Adding and subtracting within 1000) develop computational fluency, first within two digits using strategies and standard algorithms, then extending to three-digit numbers within 1,000 (TEKS 2.4.A-C, 2.7.C). Chapter 5 (Money) applies place value and addition concepts to real-world coin contexts, requiring students to determine values of coin groups and write amounts using decimal notation (TEKS 2.5.A-B). Chapter 6 (Multiplication and division) introduces foundational multiplicative reasoning through equal groups and separation into equal parts (TEKS 2.6.A-B), directly preparing students for formal multiplication and division in Grade 3. Chapter 7 (Number patterns) extends number sense by exploring even and odd numbers and finding 10 or 100 more or less than a given number within 1,200 (TEKS 2.7.A-B).

Strand 2: Geometry and Measurement (Chapters 8-10)

Once number sense and operational foundations are established, the focus shifts to spatial reasoning and measurement. Chapter 8 (2- and 3-dimensional figures) develops classification skills as students identify and describe attributes of two-dimensional shapes, including counting sides and vertices and classifying polygons, as well as identifying three-dimensional solids such as spheres, cubes, cylinders, and pyramids (TEKS 2.8.B-C). Chapter 9 (Length and area) introduces measurement concepts, requiring students to measure lengths using informal and standard units, compare lengths measured with different units, and determine area by counting unit squares (TEKS 2.9.A-B, 2.9.D-F). Chapter 10 (Time) rounds out the measurement strand with telling and writing time to the nearest minute and distinguishing between AM and PM (TEKS 2.9.G). Together, these chapters apply the counting and comparison skills from Strand 1 in geometric and measurement contexts.

Strand 3: Data Analysis (Chapter 11)

The final strand applies the number sense and representational fluency from Strands 1 and 2 to data contexts. Chapter 11 (Representing and interpreting data) requires students to organize, represent, and interpret data using bar graphs and pictographs with both single-unit and multi-unit scales (TEKS 2.10.A-D). Tasks draw on addition and subtraction from Strand 1 (to compare categories and find totals) and on the counting and comparison reasoning practiced across the earlier strands. Data problems assume the computational fluency from Strand 1 and the representational skills from Strand 2.

Grade 2 Scope and Sequence

The table below presents the recommended instructional sequence for Grade 2. Chapters are ordered so that foundational concepts support later learning: place value precedes multi-digit computation, partitioning precedes measurement, and number sense precedes data analysis. Teachers may adjust pacing to meet classroom needs while preserving the logical dependencies between chapters.

Seq	Chapter (Learning Pathway)	Subchapters	Focus TEKS
1	Representing and comparing whole numbers	Reading and writing numbers within 1,200; Understanding hundreds; Compare numbers within 1,200; Numbers within 1,200 on the number line	2.2.A-B, 2.2.D-F, 2.9.C
2	Recognize fractional units	Partitioning 2D shapes; Identify halves in shapes; Identify quarters in shapes	2.3.A, 2.3.D
3	Adding and subtracting two-digit numbers	Addition within 20; Subtracting within 20; Adding tens; Subtracting tens from two-digit numbers; Adding two- and single-digit numbers; Subtracting single digits from two-digit numbers; Adding 2-digit numbers;	2.4.A-C, 2.7.C

		Subtracting 2-digit numbers; Adding up to four 2-digit numbers; Addition and subtraction word problems with unknown in all places	
4	Adding and subtracting within 1000	Adding 10 and 100; Subtracting 10 and 100; Adding 2-digit to 3-digit numbers; Subtracting 2-digit from 3-digit numbers; Adding 3-digit numbers; Subtracting 3-digit numbers; Add and subtract within 1000	2.4.C
5	Money	Values of groups of coins (to $1); Values of coins using decimal notation	2.5.A-B
6	Multiplication and division	Count groups of objects; Multiplication as groups of objects; Division as separation	2.6.A-B
7	Number patterns	Even and odd; Find 10 and 100 more or less than a number (within 1,200)	2.7.A-B
8	2- and 3-dimensional figures	Counting sides and vertices; Identify 3D figures; Polygons	2.8.B-C
9	Length and area	Measuring length with unit models; Measuring lengths with two different unit models; Measuring cm and inch with a ruler; Area using unit squares	2.9.A-B, 2.9.D-F
10	Time	Tell and write time to the nearest minute; AM and PM to the nearest minute	2.9.G
11	Representing and interpreting data	Bar graphs with single-unit scale; Bar graphs with multi-unit scale; Pictographs with single-unit scale; Pictographs with multi-unit scale	2.10.A-D

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 2 sits early in the K-6 continuum: it assumes concrete experiences with counting, one-to-one correspondence, basic addition and subtraction within 20, and informal shape identification from Kindergarten and Grade 1, and prepares students for formal multiplication and division, fraction notation, and geometric measurement in Grades 3 through 6. Below, we trace six key mathematical strands from Kindergarten through Grade 6, with Grade 2 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 2 identifies primary focal areas including understanding the base-ten place value system, developing fluency with addition and subtraction of whole numbers, and applying mathematics to problem solving. 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 and Place Value

In Kindergarten, students count to at least 100, compose and decompose numbers up to 10, and begin using objects and drawings to represent quantities (TEKS K.2). In Grade 1, students extend counting to 120, read and write numbers using numerals, words, and expanded form, and use place value understanding to compare two-digit numbers (TEKS 1.2). Magma Math's Grade 2 content advances this progression by requiring students to read, write, and compare numbers up to 1,200 using place value charts, number lines, and comparison symbols (TEKS 2.2). Students compose and decompose hundreds, tens, and ones to understand the structure of three-digit numbers. In Grade 3, students will extend this reasoning to numbers through 99,999, including rounding and estimating (TEKS 3.2), and by Grades 4 through 6, students work with numbers to the hundred-thousands and beyond and develop understanding of decimal place value (TEKS 4.2, 5.2, 6.2).

Fractions and Rational Numbers

Early fraction concepts begin in Kindergarten and Grade 1, where students partition shapes into equal parts and use informal language to describe halves, fourths, and eighths. Grade 2 formalizes this work: students partition two-dimensional shapes into halves and fourths and identify the fractional parts that result (TEKS 2.3.A, 2.3.D). Magma Math's partitioning chapter provides the visual scaffolding that makes this transition accessible, using dashed lines and shaded regions to make equal parts visible. In Grade 3, students extend to unit fractions with denominators of 2, 3, 4, 6, and 8 and represent fractions using area models, fraction bars, and number lines (TEKS 3.3). Grade 4 introduces equivalence and operations on fractions (TEKS 4.3), and by Grades 5 and 6, students operate on fractions with unlike denominators and apply fraction reasoning to ratios and proportional relationships (TEKS 5.3, 6.3).

Operations

Addition and subtraction develop across Kindergarten through Grade 1, where students join and separate concrete objects and build fluency within 20 (TEKS K.3, 1.3, 1.5). Grade 2 solidifies this fluency by extending addition and subtraction to two-digit and three-digit numbers within 1,000, including problems that involve regrouping and the addition of up to four two-digit numbers (TEKS 2.4.A-C). Magma Math's computation chapters scaffold these procedures from base-ten block models through bare symbolic computation. Simultaneously, Grade 2 introduces foundational multiplicative reasoning through equal groups and separation into equal parts (TEKS 2.6.A-B), directly preparing students for formal multiplication and division facts in Grade 3 (TEKS 3.4, 3.5). By Grades 4 through 6, students extend to multi-digit multiplication and division, operations with decimals, and problem solving across all four operations (TEKS 4.4, 5.3, 6.3).

Algebraic Reasoning

Algebraic thinking in the early grades focuses on patterns, properties of operations, and the relationship between equations and real-world situations. In Kindergarten and Grade 1, students recite numbers in sequences, skip count, and explore patterns in addition and subtraction (TEKS K.5, 1.5). Grade 2 extends this reasoning: students determine whether numbers are even or odd using concrete models, find 10 or 100 more or less than a given number within 1,200, and solve word problems with unknowns in all positions (TEKS 2.7.A-C). Magma Math's number patterns and word problem subchapters engage students in these tasks across all M/M/S levels, with Spicy problems requiring students to chain operations or reason backward from a result. In Grade 3, students describe and create numeric patterns and solve equations with unknowns (TEKS 3.5), and by Grades 4 through 6, algebraic reasoning expands to include input-output tables, expressions, equations with variables, and one-variable inequalities (TEKS 4.5, 5.4, 6.6).

Geometry and Measurement

Geometric reasoning progresses from recognizing and naming shapes in Kindergarten to classifying shapes by attributes in Grades 1 and 2. In Grade 2, students identify and describe attributes of two-dimensional and three-dimensional figures, count sides and vertices of polygons, classify shapes, and identify three-dimensional solids (TEKS 2.8.B-C). Measurement in Grade 2 includes measuring lengths with standard and non-standard units, comparing lengths measured with different units, and finding area using unit squares (TEKS 2.9.A-B, 2.9.D-F), as well as telling time to the nearest minute (TEKS 2.9.G). The area work is particularly significant: it links counting unit squares to the multiplicative area reasoning students will develop in Grade 3 (TEKS 3.6.C-E, 3.7.B). In Grades 4 through 6, students extend to angle measurement, coordinate geometry, conversions, and volume (TEKS 4.6-4.7, 5.4-5.7, 6.8).

Data Analysis

Data representation begins in Kindergarten with sorting and classifying objects, and Grade 1 introduces picture graphs and bar graphs with single-unit scales (TEKS K.8, 1.8). Grade 2 advances this strand by requiring students to organize data into bar graphs and pictographs with both single-unit and multi-unit scales, draw conclusions by comparing categories, and write descriptions of data (TEKS 2.10.A-D). These tasks demand that students apply addition and subtraction (to compare categories and compute totals) and comparison reasoning, connecting data analysis back to the operations strand. In Grades 3 and 4, students work with frequency tables, line plots, and dot plots (TEKS 3.8, 4.9), and by Grades 5 and 6, students analyze data distributions and measures of center, extending the representational and interpretive skills built in Grade 2 (TEKS 5.9, 6.12-6.13).

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 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 2 activate conceptual knowledge that students built in Kindergarten and Grade 1. In the Adding tens subchapter (TEKS 2.4.B, 2.4.C), Mild tasks present addition of multiples of ten alongside number lines with labeled intervals, connecting the Grade 1 concept of tens and ones composition to the new demands of two-digit computation (TEKS 1.2). A Mild problem in this subchapter might show a number line from 30 to 80 with an arrow labeled "+10" starting at 40, providing the visual structure that bridges counting by tens to additive computation. Similarly, in the Identify halves in shapes subchapter (TEKS 2.3.D), Mild problems present a circle or rectangle with a dashed line through the center and ask students whether the partition creates equal parts, activating the informal partitioning and fair-sharing experiences from Grade 1 (TEKS 1.6) in which students divided shapes into equal parts. 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 2 standards. In the Adding 2-digit numbers subchapter (TEKS 2.4.B, 2.4.C), Medium tasks require students to add two-digit numbers with regrouping and no scaffolding, building directly on the single-digit addition procedures mastered in Grade 1 (TEKS 1.3, 1.5). A Medium problem might present a bare expression requiring students to compose a ten from ones and execute the regrouping procedure independently. In the Compare numbers within 1,200 subchapter (TEKS 2.2.D), Medium problems require students to compare three-digit numbers using inequality symbols without place value charts, extending the comparison procedures students practiced with two-digit numbers in Grade 1 (TEKS 1.2.E-F). 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 2 standards.

Connecting Current Learning to Future Conceptual Demands

Spicy problems in Grade 2 foreshadow the conceptual demands students will encounter in Grades 3 through 6. In the Multiplication as groups of objects subchapter (TEKS 2.6.A), Spicy tasks require students to interpret a scenario involving equal groups with an additional modification, such as adding or removing items from each group after the initial grouping. A Spicy problem might describe a student who packed boxes with a certain number of items, then added more to each box, requiring students to select the expression that represents the total. This kind of two-step multiplicative reasoning prepares students for the formal multiplication and multistep problem-solving expectations of Grade 3 (TEKS 3.4.K, 3.5.B). In the Partitioning 2D shapes subchapter (TEKS 2.3.A), Spicy problems ask students to compare different partitions of the same shape and determine which produces truly equal parts, anticipating the equivalence reasoning that becomes central to fraction concepts in Grade 3 (TEKS 3.3.A-H).

Connecting Current Learning to Future Procedural Demands

Medium problems in Grade 2 also establish procedural fluencies that become prerequisites for future grades. Addition and subtraction fluency within 1,000, practiced extensively through Medium tasks across the computation chapters (TEKS 2.4.A-C), is the procedural bedrock on which Grade 3's multi-digit addition and subtraction with regrouping and multistep word problems depend (TEKS 3.4.A, 3.5.A). Students who achieve automaticity with two-digit and three-digit computation in Grade 2 can devote cognitive resources to learning new procedures rather than recalculating basic sums and differences. Likewise, Medium problems in the Bar graphs with multi-unit scale subchapter (TEKS 2.10.A, 2.10.B, 2.10.D) require students to read and interpret graphs in which each unit on the scale represents more than one, a procedure that Grade 3 extends to frequency tables, line plots, and more complex data displays (TEKS 3.8.A-B). 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 2 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 Adding 2-digit numbers subchapter (TEKS 2.4.B, 2.4.C), Mild tasks display base-ten blocks arranged to show tens as vertical stacks and ones as individual units, so that students can see the grouping structure before computing. In the Area using unit squares subchapter (TEKS 2.9.F), Mild problems present figures composed of colored unit squares that students count to determine area. 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 addition problem presents a bare equation such as a two-digit plus two-digit sum with regrouping, and a Medium comparison problem asks students to order numbers using inequality symbols without accompanying place value charts. 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 partitioned shapes or draw bar graphs, defining mathematical terms through precise visual referents (a dashed line through a circle that shows exactly what one-half means), and explaining their reasoning when Spicy tasks require students to justify a classification or evaluate a partition. 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 Values of groups of coins subchapter (TEKS 2.5.A), a Mild task presents images of individual coins and asks students to identify the value of each coin, requiring students to interpret the visual representation and translate it into a numerical answer. In the Bar graphs with single-unit scale subchapter (TEKS 2.10.A, 2.10.C), Mild problems present completed bar graphs and ask students to read the height of a single bar to determine how many items are in one category. 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 Numbers within 1,200 on the number line subchapter (TEKS 2.2.E, 2.2.F, 2.9.C), a Medium problem presents a number line with some values labeled and requires students to determine the position or value of an unlabeled point by analyzing the scale and intervals. In the Pictographs with multi-unit scale subchapter (TEKS 2.10.A, 2.10.B, 2.10.D), Medium problems require students to analyze a pictograph in which each symbol represents more than one unit and determine totals by applying skip counting.

Evaluate

Spicy problems require students to evaluate mathematical reasoning, strategies, and solutions. In the Subtracting single digits from two-digit numbers subchapter (TEKS 2.4.B, 2.4.C), a Spicy task presents an equation with a missing value and requires students to determine the unknown by reasoning backward from the result, evaluating which number produces the correct difference. In the Polygons subchapter (TEKS 2.8.C), a Spicy problem presents a collection of shapes and requires students to evaluate which shapes meet the definition of a polygon and which do not, applying classification criteria to make a judgment.

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 Adding tens subchapter (TEKS 2.4.B, 2.4.C), a Spicy problem embeds multi-step addition in a real-world scenario involving multiple packages with different weights, requiring students to chain three or more addends in a context that does not signal the procedure. In the Measuring lengths with two different unit models subchapter (TEKS 2.9.B), a Spicy task describes a crayon measured in two different units and asks students to determine the length of a second crayon that is twice as long, synthesizing measurement reasoning with multiplicative thinking in a novel context. 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 2. In the Addition within 20 subchapter (TEKS 2.4.A), Medium tasks present basic addition facts without visual support, requiring students to recall sums through structured repetition across all single-digit combinations. The same structure appears in the Subtracting within 20 subchapter (TEKS 2.4.A), where Medium problems require automatic recall of differences. 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 addition and subtraction procedures flexibly, accurately, and efficiently as they move to more complex tasks within Grade 2 and into Grade 3.

Efficiency, Flexibility, and Accuracy

Magma Math provides opportunities for students to evaluate representations, models, strategies, and solutions for efficiency, flexibility, and accuracy across Grade 2 content. Efficiency appears when Spicy addition problems ask students to compute and arrange multiple multi-addend sums in ascending order, encouraging them to identify computational shortcuts such as grouping compatible numbers (TEKS 2.4.B, 2.4.C). Flexibility is evident in the Multiplication and division 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 (TEKS 2.6.A-B). Accuracy is developed through missing-value tasks in the subtraction subchapters, where Spicy problems present an equation with a blank and ask students to determine the unknown, requiring them to verify their answer against the original equation and identify any computational errors (TEKS 2.4.B, 2.4.C). Together, these three dimensions ensure that Grade 2 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 2 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 Values of groups of coins (TEKS 2.5.A), a task presents images of familiar coins so that students see addition as a tool for determining the value of real-world objects. At the Medium level, in Adding tens (TEKS 2.4.B, 2.4.C), a problem embeds computation in a word problem about combining quantities, such as a student calculating the total weight of packages. At the Spicy level, in Subtracting tens from two-digit numbers (TEKS 2.4.B, 2.4.C), a problem presents a multi-step scenario, such as subtracting two sequential purchases from a starting amount, 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 Addition and subtraction word problems with unknown in all places (TEKS 2.7.C), a task presents a straightforward join or separate situation and provides a concrete model that directly represents the mathematical concept, guiding students through the first step of analysis. At the Medium level, in Adding 2-digit numbers (TEKS 2.4.B, 2.4.C), a 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 the same subchapter (TEKS 2.7.C), a problem describes a start-unknown situation in which a student received additional items and now has a known total, requiring students to formulate a plan for reasoning backward and justify their answer. 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 Adding 2-digit numbers (TEKS 2.4.B, 2.4.C), problems present base-ten blocks as tools for grouping and counting, making the tool selection explicit. At the Medium level, in the same pathway, students use mental math or paper-and-pencil techniques independently, choosing the appropriate technique without guidance. At the Spicy level, in Adding up to four 2-digit numbers (TEKS 2.4.B, 2.4.C), a problem requires students to select efficient computational techniques to manage multiple addends, 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 Identify 3D figures (TEKS 2.8.B), students select the correct name for a pictured three-dimensional shape, communicating the connection between a visual representation and precise mathematical vocabulary. At the Medium level, in Compare numbers within 1,200 (TEKS 2.2.D), students express numerical relationships using comparison symbols, communicating magnitude relationships through symbolic notation. At the Spicy level, in Reading and writing numbers within 1,200 (TEKS 2.2.A, 2.2.B), students match numbers to their word forms, requiring multi-representational reasoning that connects symbolic, verbal, and place value formats. 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 Count groups of objects (TEKS 2.6.A), students interact with arrays and grouped images to represent multiplicative situations, using an existing representation. At the Medium level, in Pictographs with single-unit scale (TEKS 2.10.A, 2.10.C), students are given data and must organize it into a pictograph, building the representation themselves. At the Spicy level, in Bar graphs with multi-unit scale (TEKS 2.10.A, 2.10.B, 2.10.D), students construct bar graphs with appropriate titles, labels, and scales from given data tables, creating the entire representation from scratch before answering questions. 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 Find 10 and 100 more or less than a number (TEKS 2.7.B), a task presents a hundreds chart, making the relationship between adding 10 and moving one row explicit through visual arrangement. At the Medium level, in Measuring lengths with two different unit models (TEKS 2.9.B), students analyze the relationship between an object's length and the size of the measurement unit, recognizing that smaller units produce larger counts. At the Spicy level, in Even and odd (TEKS 2.7.A), a problem asks students to determine whether a given sum is even or odd, requiring them to analyze and connect the parity of individual addends to the parity of their sum. 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 Polygons (TEKS 2.8.C), students classify shapes using precise geometric vocabulary such as triangle, quadrilateral, and pentagon, justifying their choice by analyzing each shape's attributes against the definition. At the Medium level, in Identify quarters in shapes (TEKS 2.3.D), a problem asks students to determine how a shape should be partitioned to create equal fourths, requiring them to explain the partition using mathematical language about equal parts. At the Spicy level, in Partitioning 2D shapes (TEKS 2.3.A), students are shown two different partitions of the same shape and must determine which produces truly equal parts, justifying their reasoning by evaluating each partition against the definition of equal shares. 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 2 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: Representing and comparing whole numbers	(C) Tool selection: place value charts and number lines for locating and comparing numbers; (D) Multiple representations: expanded form, standard form, word form, and number line positions; (E) Creating representations: placing numbers on the number line
Ch 2: Recognize fractional units	(D) Multiple representations: partitioned shapes showing halves and fourths; (E) Creating representations: drawing partition lines on shapes; (G) Justification: determining whether partitions produce equal parts
Ch 3: Adding and subtracting two-digit numbers	(A) Problem solving: real-world addition and subtraction contexts; (B) Problem-solving model: analyzing word problems with unknowns in all positions; (C) Tool selection: base-ten blocks and number lines for regrouping
Ch 4: Adding and subtracting within 1000	(A) Problem solving: multi-step word problems with three-digit numbers; (D) Multiple representations: vertical algorithms, number lines, and word problems; (F) Relationships: connecting regrouping across place values

Ch 5: Money	(A) Problem solving: real-world coin and purchase contexts; (C) Tool selection: coin images for determining values; (D) Multiple representations: coin images, decimal notation, and cent values
Ch 6: Multiplication and division	(A) Problem solving: real-world equal-group and sharing contexts; (D) Multiple representations: arrays, grouped objects, and repeated addition; (F) Relationships: connecting multiplication and division as inverse operations
Ch 7: Number patterns	(F) Relationships: analyzing patterns when adding or subtracting 10 and 100; (C) Tool selection: hundreds charts for locating and extending patterns; (G) Justification: determining whether sums are even or odd
Ch 8: 2- and 3-dimensional figures	(D) Multiple representations: visual classification of figures by attributes; (G) Justification: verifying shape classifications against definitions; (C) Tool selection: real-world objects as models for 3D figures
Ch 9: Length and area	(C) Tool selection: rulers, unit models, and unit squares for measuring; (E) Creating representations: constructing measurements with different units; (F) Relationships: connecting unit size to number of units needed
Ch 10: Time	(C) Tool selection: analog and digital clocks; (A) Problem solving: telling time in real-world AM/PM contexts; (D) Multiple representations: analog clock faces and digital time notation
Ch 11: Representing and interpreting data	(A) Problem solving: one- and two-step problems using data from graphs; (D) Multiple representations: bar graphs, pictographs, and data tables; (E) Creating representations: constructing graphs with appropriate titles, labels, and scales

End of Alignment Guide. Grade 2. Magma Math IMRA Submission.