

6A-4.0167 Florida Mathematics Endorsement (K-12) Competencies.

(1) The competencies and performance indicators required for approval of educator preparation programs pursuant to Rule 6A-4.0166, F.A.C., and for district add-on endorsement programs pursuant to Section 1012.575, F.S., for certification in the Mathematics Endorsement (K-12), are contained in the publication, Florida Mathematics Endorsement (K-12) Competencies 2026, effective August 2026<insert link>, which is hereby incorporated by reference and made a part of this rule. The Mathematics Endorsement (K-12) Competencies 2026 may be obtained from the Bureau of Standards and Instructional Support website at <https://www.fldoe.org/academics/standards/subject-areas/math-science/>.

(2) Florida Mathematics endorsement programs must use the Mathematics Endorsement (K-12) Competencies 2026. Mathematics endorsement matrices for district add-on programs and teacher preparation programs must be submitted for review and approval in the format provided by the department. The Mathematics Endorsement (K-12) Matrix 2026, effective August 2026, <insert link>, which is incorporated herein by reference and can be found at <https://www.fldoe.org/academics/standards/subject-areas/math-science/>.

Rulemaking Authority 1001.02(2), 1012.55(1), FS; Chapter 2025-109, LOF. Law Implemented 1012.55(1), FS; Chapter 2025-109, LOF. History--
New 8-x-26.

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Guiding Principles, Purpose and Vision

The Mathematics Endorsement (K-12) Competencies are aligned with evidence-based tiered instructional strategies informed by Florida's Formula for Success. The competencies address the strands within the Benchmarks for Excellent Student Thinking (B.E.S.T.) Standards for Mathematics, including Number Sense and Operations, Fractions, Algebraic Reasoning and Functions, Measurement, Geometric Reasoning, and Data Analysis and Probability. The elements of Florida's Formula for Success are integrated throughout the Mathematics Endorsement Competencies by focusing on five characteristics of benchmarks-aligned, high-quality instruction (horizontal and vertical alignment, balanced instructional approaches, planning for student learning, instruction informed by data, implementing tiered instruction); five types of assessment (screening, progress monitoring, diagnostic, summative, formative); and instruction that is accessible for all students (Tier 1), supplemental instruction and intervention for some students (Tier 2), and intensive instruction and intervention for few students (Tier 3).

Teachers will understand and deliver evidence-based tiered instructional strategies, ensuring accessibility for all learners. The Mathematics Endorsement indicates that a teacher has attained additional professional knowledge of mathematics content and evidence-based instructional practice at the level they are certified to teach. This add-on credential ensures that teachers possess a comprehensive understanding of specialized mathematics instruction with Number Sense and Operations, Fractions, Algebraic Reasoning and Functions, Measurement, Geometric Reasoning, and Data Analysis and Probability. Through this endorsement, teachers will acquire additional professional preparation in tiered mathematics instruction. The teacher will have the knowledge and ability to effectively identify, develop and implement benchmarks-aligned, high-quality instruction to support learners in their development of conceptual understanding; address student misconceptions; and cultivate mathematical thinking, reasoning and problem-solving skills.

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Overview

The Florida Mathematics Endorsement Matrix provides a means for school districts, institutions of higher education and other entities that provide mathematics endorsement courses to document the alignment of their coursework to the strands, standards and performance indicators adopted by the State Board of Education in July 2026 pursuant to [<insert link>](#).

Guidelines for Submissions

- Matrix is submitted in a Word document.
- Formatting of the template has not been altered (e.g., performance indicators moved or combined, page numbers removed).
- If readings are included, include the text title, author, and chapter title(s), as applicable.
- Resources identified in the matrix must be current (within the past 5 years).
- Include hyperlinks for all resources being used.
- Any links included in the matrix are active and accessible.

Directions

1. Submit the completed matrix as a Word document. Include contact information for the preparer: Name, Position, Email, Phone and District.
2. Each assignment or assessment must include a concise description demonstrating how it measures the 6 Mathematics Competencies.
3. All 66 performance indicators must be addressed at least once. For each performance indicator, provide a description of how it will be addressed (e.g., course reading, activity, discussion, quiz).

District	
Preparer's Name and Position	
Email	
Phone Number	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

DRAFT

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Strand (Competency): Number Sense and Operations (NSO)	
Standard	
NSO.1: Vertical and Horizontal Alignment within Number Sense and Operations Teachers demonstrate strategies that support all learners in the progression of content within Number Sense and Operations.	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
NSO.1.1 Provide instruction and experiences that address the vertical alignment of Number Sense and Operations. <i>Clarification 1:</i> Instruction includes, but is not limited to, place value and base ten, flexible number representation, estimation, computational fluency, properties of operations, mathematics vocabulary, and problem solving within all number systems. <i>Clarification 2:</i> Instruction includes connecting number relationships across grade or course levels to support progression of understanding. <i>Clarification 3:</i> Instruction includes, but is not limited to, engaging all learners in representing numbers in multiple ways, explaining place-value relationships and applying properties of operations to solve problems across multiple number systems.	
Description of Assignment(s)	
Performance Indicator	
NSO.1.2 Provide instruction and experiences that address the horizontal alignment of Number Sense and Operations. <i>Clarification 1:</i> Instruction includes making connections to additional Florida’s B.E.S.T. Standards. <i>Clarification 2:</i> Instruction includes reading, writing, representing and modeling numbers appropriate to grade or course level; explaining the value of digits based on place using concrete, pictorial and abstract representations; composing and decomposing numbers flexibly; and comparing, ordering and reasoning about numbers.	
Description of Assignment(s)	
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

<p>NSO.1.3 Understand the continuum of arithmetic operations consisting of exploration, procedural reliability, procedural fluency and automaticity. <i>Clarification 1:</i> Instruction includes opportunities for all learners to accurately and efficiently perform operations based upon grade- or course-level benchmarks, building toward fluency through reasoning and structure. <i>Clarification 2:</i> Instruction includes opportunities for all learners to select appropriate strategies based on content and context of the task or item, explain relationships between operations, and adapt all learners’ chosen procedures to new concepts.</p>	
Description of Assignment(s)	
Standard	
<p>NSO.2: Planning for Learning and Teaching within Number Sense and Operations Teachers demonstrate strategies that support all learners in the learning and teaching of Number Sense and Operations through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify possible student misconceptions and provide tiered instruction to support all learners.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
<p>NSO.2.1 Provide instruction and experiences that focus on student learning. <i>Clarification 1:</i> Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs. <i>Clarification 2:</i> Instruction includes implementing various instructional approaches, based on multiple data points, to support all learners in the development and application of Number Sense and Operations skills. <i>Clarification 3:</i> Instruction includes implementing evidence-based practices for learners with deficiencies, aligned to their strengths and needs to support their mastery in Number Sense and Operations. <i>Clarification 4:</i> Refer to the Florida Mathematics Endorsement Glossary for assessment types and instructional approaches. <i>Clarification 5:</i> Refer to Florida’s B.E.S.T. Instructional Guide for Mathematics Intervention.</p>	
Description of Assignment(s)	
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

NSO.2.2 Integrate the use of appropriate manipulatives, technological tools and resources into instruction to support all learners' development of mathematical language and content knowledge within Number Sense and Operations.

Clarification 1: Manipulatives and tools include, but are not limited to, number lines, ten frames, arrays, base-ten blocks, place-value charts, integer chips, algebra tiles, geoboards, measurement tools, equation strips, diagrams and graphic organizers to aid all learners in their understanding of Number Sense and Operations.

Clarification 2: Technological tools and resources include, but are not limited to, virtual manipulatives, calculators and mathematics-specific dynamic software.

Clarification 3: Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Number Sense and Operations.

Description of Assignment(s)

Performance Indicator

NSO.2.3 Plan for and provide problem-solving opportunities associated with Number Sense and Operations, providing feedback to support conceptual understanding and fluency.

Clarification 1: Instruction includes engaging all learners in problem-solving experiences, making use of patterns and structures, applying reading strategies, and explaining learners' reasoning.

Clarification 2: Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify and compare solution strategies.

Description of Assignment(s)

Performance Indicator

NSO.2.4 Create a learning environment where all learners practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.

Clarification 1: Instruction includes solving problems using the application of relevant operations. Refer to Situations Involving Operations with Numbers (Appendix A).

Clarification 2: Instruction includes representing problems in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations.

Clarification 3: Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle.

Description of Assignment(s)

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Performance Indicator	
<p>NSO.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within Number Sense and Operations. <i>Clarification 1:</i> Instruction includes all learners predicting results by estimating quantities using numerical benchmarks and number relationships, and monitoring calculations, procedures and intermediate results during the process of solving problems. <i>Clarification 2:</i> Instruction includes all learners reflecting on and determining whether answers make sense given the context, and revising solutions when results are unreasonable. <i>Clarification 3:</i> Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.</p>	
Description of Assignment(s)	
Standard	
<p>NSO.3: Assessment within Number Sense and Operations Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
<p>NSO.3.1 Provide knowledge of the five types of assessments. <i>Clarification 1:</i> The five types of assessments are diagnostic, screening, progress monitoring, formative and summative. <i>Clarification 2:</i> Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.</p>	
Description of Assignment(s)	
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

NSO.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners.
Clarification 1: Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks.
Clarification 2: Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners.
Clarification 3: Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.

Description of Assignment(s)

Performance Indicator

NSO.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics.
Clarification 1: Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.

Description of Assignment(s)

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Strand: Fractions (FR)	
Standard	
FR.1: Vertical and Horizontal Alignment within Fractions Teachers demonstrate strategies that support all students in the progression of content within Fractions.	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
FR.1.1 Provide instruction and experiences that address the vertical alignment of Fractions. <i>Clarification 1:</i> Instruction includes, but is not limited to, number lines, flexible number representation (mixed numbers and fractions greater than one), estimation, computational fluency, properties of operations, mathematics vocabulary and problem solving within all number systems. <i>Clarification 2:</i> Instruction includes connecting fractions across grade or course levels to support progression of understanding. Instruction includes progression from unit fractions as equal parts of a whole or set; to representing fractions as numbers on a number line; to generating, comparing and reasoning about equivalent fractions; and to fractions in real-world contexts. <i>Clarification 3:</i> Instruction includes, but is not limited to, engaging all learners in representing fractions in multiple ways (including number lines and flexible representations such as mixed numbers and fractions greater than one), using estimation and computational fluency to make sense of fraction operations, applying properties of operations, and using precise mathematics vocabulary to explain reasoning and solve problems within all number systems.	
Description of Assignment(s)	
Performance Indicator	
FR.1.2 Provide instruction and experiences that address the horizontal alignment of Fractions. <i>Clarification 1:</i> Instruction includes making connections to additional Florida’s B.E.S.T. Standards. <i>Clarification 2:</i> Instruction includes reading, writing, representing and modeling numbers appropriate to grade or course level; explaining the value of digits based on place using concrete, pictorial and abstract representations; composing and decomposing numbers flexibly; and comparing, ordering and reasoning about numbers.	
Description of Assignment(s)	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Performance Indicator	
<p>FR.1.3 Understand the continuum of operations with fractions, consisting of exploration, procedural reliability, procedural fluency and automaticity. <i>Clarification 1:</i> Instruction includes opportunities for all learners to accurately and efficiently perform operations based on grade- or course-level benchmarks, building fluency through reasoning and structure. <i>Clarification 2:</i> Instruction includes opportunities for all learners to select appropriate strategies based on content and context of the task or item, explain relationships between operations, and adapt all learners’ chosen procedures to new concepts.</p>	
Description of Assignment(s)	
Standard	
<p>FR.2: Planning for Learning and Teaching within Fractions Teachers demonstrate strategies that support all learners in the learning and teaching of Fractions through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify possible student misconceptions and provide tiered instruction to support all learners.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
<p>FR.2.1 Provide instruction and experiences that focus on student learning. <i>Clarification 1:</i> Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs. <i>Clarification 2:</i> Instruction includes applying various instructional approaches, based on multiple data points, to support student development of fractions concepts. <i>Clarification 3:</i> Instruction includes implementing evidence-based practices for learners with deficiencies, aligned to their strengths and needs to support their mastery in fractions. <i>Clarification 4:</i> Refer to the Florida Mathematics Endorsement Glossary for assessment types and instructional approaches. <i>Clarification 5:</i> Refer to Florida’s B.E.S.T. Instructional Guide for Mathematics Intervention.</p>	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Description of Assignment(s)
Performance Indicator
<p>FR.2.2 Integrate the use of appropriate manipulatives, technological tools and resources into instruction to support all learners’ development of mathematical language and content knowledge within Fractions.</p> <p><i>Clarification 1:</i> Manipulatives and tools include, but are not limited to, number lines, fraction tiles, diagrams and graphic organizers to aid all learners in their understanding of fractions.</p> <p><i>Clarification 2:</i> Technological tools and resources include, but are limited to, virtual manipulatives, calculators and mathematics-specific dynamic software.</p> <p><i>Clarification 3:</i> Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of fractions.</p>
Description of Assignment(s)
Performance Indicator
<p>FR.2.3 Plan for and provide problem-solving opportunities associated with Fractions, providing feedback to support conceptual understanding and fluency.</p> <p><i>Clarification 1:</i> Instruction includes engaging all learners in problem-solving experiences with fractions, making use of patterns and structures, applying reading strategies, and explaining their reasoning using precise mathematics vocabulary.</p> <p><i>Clarification 2:</i> Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare and refine solution strategies within fractions contexts.</p>
Description of Assignment(s)
Performance Indicator
<p>FR.2.4 Create a learning environment where all learners practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.</p> <p><i>Clarification 1:</i> Instruction includes solving problems using relevant operations and representing their thinking in multiple ways (i.e., manipulatives, equations, models, tables or diagrams), while explaining connections among representations.</p> <p><i>Clarification 2:</i> Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle.</p>
Description of Assignment(s)

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Performance Indicator	
<p>FR.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within Fractions. <i>Clarification 1:</i> Instruction includes estimating quantities and results using fractional benchmarks and number relationships, determining whether answers make sense given the context, and revising solutions when results are unreasonable. <i>Clarification 2:</i> Instruction includes students reflecting on and determining whether answers make sense given the context, and revising solutions when results are unreasonable. <i>Clarification 3:</i> Instruction includes students providing explanations and justifications of their thinking and evaluating the thinking of others.</p>	
Description of Assignment(s)	
Standard	
<p>FR.3: Assessment within Fractions Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
<p>FR.3.1 Provide knowledge of the five types of assessments. <i>Clarification 1:</i> The five types of assessments are diagnostic, screening, progress monitoring, formative and summative. <i>Clarification 2:</i> Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.</p>	
Description of Assignment(s)	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Performance Indicator
FR.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners. <i>Clarification 1:</i> Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks. <i>Clarification 2:</i> Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners. <i>Clarification 3:</i> Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.
Description of Assignment(s)
Performance Indicator
FR.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or those who have a substantial deficiency in mathematics. <i>Clarification 1:</i> Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.
Description of Assignment(s)

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Strand: Algebraic Reasoning and Functions (ARF)	
Standard	
<p>ARF.1: Vertical and Horizontal Alignment within Algebraic Reasoning and Functions Teachers demonstrate strategies that support all learners in the progression of content within Algebraic Reasoning and Functions, integrating content knowledge from other strands (such as Number Sense and Operations).</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
<p>ARF.1.1 Provide instruction and experiences that address the vertical alignment of Algebraic Reasoning and Functions: <i>Clarification 1:</i> Instruction includes representing and solving problems using operations; explaining the meaning of the equal sign and equality; recognizing numerical patterns; analyzing input-output relationships; working with numerical and algebraic expressions and inequalities; generating equivalent equations and expressions; exploring relationships and proportional reasoning; solving systems of equations; graphing equations; and graphing and interpreting polynomial functions, including understanding properties and transformations of functions. <i>Clarification 2:</i> Instruction includes connecting Algebraic Reasoning and Functions across grade or course level to support progression of understanding. <i>Clarification 3:</i> Instruction includes, but is not limited to, engaging all learners in representing and solving problems using operations; explaining and justifying the meaning of the equal sign and equality; recognizing and analyzing numerical patterns and input-output relationships; working with and generating equivalent numerical and algebraic expressions, equations and inequalities; applying properties of operations; exploring relationships including proportional reasoning; solving systems of equations; and graphing, interpreting and analyzing equations and functions, including polynomial functions and their transformations, using precise mathematics vocabulary to communicate reasoning.</p>	
Description of Assignment(s)	
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

<p>ARF.1.2 Provide instruction and experiences that address the horizontal alignment of Algebraic Reasoning and Functions. <i>Clarification 1:</i> Instruction includes making connections to additional Florida’s B.E.S.T. Standards for representing and solving problems using operations; explaining the meaning of the equal sign and equality; recognizing numerical patterns; analyzing input-output relationships; working with numerical and algebraic expressions and inequalities; generating equivalent equations and expressions; exploring relationships and proportional reasoning; solving systems of equations; graphing equations; and graphing and interpreting polynomial functions, including understanding properties and transformations of functions. <i>Clarification 2:</i> Instructions include reading, writing, representing and modeling algebraic reasoning and function concepts appropriate to grade or course level using different representations (such as concrete, pictorial and abstract).</p>	
Description of Assignment(s)	
Performance Indicator	
<p>ARF.1.3 Understand the continuum of algebraic operations and functions, consisting of exploration, procedural reliability, procedural fluency and automaticity. <i>Clarification 1:</i> Instruction includes opportunities for all learners to accurately and efficiently perform operations based upon grade- or course-level benchmarks, building toward fluency through reasoning and structure. <i>Clarification 2:</i> Instruction includes opportunities for all learners to select appropriate strategies based on content and context of the task or item, explain relationships between operations, and adapt all learners’ chosen procedures to new concepts.</p>	
Description of Assignment(s)	
Standard	
<p>ARF.2: Planning for Learning and Teaching within Algebraic Reasoning and Functions Teachers demonstrate strategies that support all students in the learning and teaching of Algebraic Reasoning and Functions through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify students’ misconceptions and provide tiered instruction to support all learners.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

ARF.2.1 Provide instruction and experiences that focus on student learning.
Clarification 1: Instruction includes administering and documenting appropriate assessments to inform instructional decisions, with consideration of individual student strengths and needs.
Clarification 2: Instruction includes implementing various instructional approaches, based on multiple data points, to support all learners in the development and application of Algebraic Reasoning and Functions.
Clarification 3: Instruction includes implementing evidence-based practices for learners with deficiencies, aligned to their strengths and needs to support mastering concepts of Algebraic Reasoning and Functions.
Clarification 4: Refer to the Florida Mathematics Endorsement Glossary for assessment types and instructional approaches.
Clarification 5: Refer to Florida’s B.E.S.T. Instructional Guide for Mathematics Intervention.

Description of Assignment(s)

Performance Indicator

ARF.2.2 Integrate the use of appropriate manipulatives, technological tools and resources into instruction to support all learners’ development of mathematical language and content knowledge within Algebraic Reasoning and Functions.
Clarification 1: Manipulatives include, but are not limited to, counters, connecting cubes, pattern blocks, algebra tiles, balance scales, individual dry-erase boards, arrays, diagrams and graphic organizers to support all learners in their understanding of Algebraic Reasoning and Functions.
Clarification 2: Technology tools and resources include, but are not limited to, classroom engagement tools, mathematics-specific dynamic software, calculators and virtual manipulatives.
Clarification 3: Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Algebraic Reasoning and Functions.

Description of Assignment(s)

Performance Indicator

MATHEMATICS ENDORSEMENT (K-12) MATRIX

ARF.2.3 Plan for and provide problem-solving opportunities associated with Algebraic Reasoning and Functions, providing feedback to support conceptual understanding and fluency.

Clarification 1: Instruction includes engaging all learners in problem-solving experiences related to algebraic reasoning and functions, making use of patterns and structures, applying reading strategies, and explaining their reasoning using precise mathematics vocabulary.

Clarification 2: Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare and refine solution strategies within algebraic reasoning and function contexts.

Clarification 3: Instruction includes, but is not limited to, engaging all learners in representing unknown quantities; identifying and extending patterns; modeling relationships in multiple ways (i.e., tables, graphs, equations); interpreting relationships; understanding the meaning of quantities in context; and making connections across representations through tasks such as pattern exploration, real-world modeling tasks, systems of equations scenarios and function comparisons.

Clarification 4: Instruction includes providing constructive and guiding feedback that supports all learners' problem-solving habits, including reasoning, explanation, the use of multiple strategies and perseverance through productive struggle, while identifying specific areas for improvement.

Description of Assignment(s)

Performance Indicator

ARF.2.4 Create a learning environment where all learners practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.

Clarification 1: Instruction includes problem-solving opportunities related to algebraic reasoning and functions using relevant operations and representing thinking in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations.

Clarification 2: Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle.

Clarification 3: Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying their thinking and reasoning.

Description of Assignment(s)

Performance Indicator

MATHEMATICS ENDORSEMENT (K-12) MATRIX

<p>ARF.2.5 Demonstrate a conceptual understanding to describe and analyze relationships between concepts within Algebraic Reasoning and Functions. <i>Clarification 1:</i> Instruction includes all learners predicting and justifying results by analyzing patterns, relationships and functions, and evaluating the reasonableness throughout the problem-solving process. <i>Clarification 2:</i> Instruction includes all learners reflecting and determining whether answers make sense in context and revising solutions when results are unreasonable. <i>Clarification 3:</i> Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.</p>	
Description of Assignment(s)	
Standard	
<p>ARF.3: Assessment within Number Sense and Operations Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
<p>ARF.3.1 Provide knowledge of the five types of assessments. <i>Clarification 1:</i> The five types of assessments are diagnostic, screening, progress monitoring, formative and summative. <i>Clarification 2:</i> Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.</p>	
Description of Assignment(s)	
Performance Indicator	
<p>ARF.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners. <i>Clarification 1:</i> Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks. <i>Clarification 2:</i> Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners. <i>Clarification 3:</i> Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.</p>	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Description of Assignment(s)
Performance Indicator
ARF.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics. <i>Clarification 1:</i> Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.
Description of Assignment(s)

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Strand: Measurement (M)	
Standard	
M.1: Vertical and Horizontal Alignment within Measurement	
Teachers demonstrate strategies that support all learners in the progression of content within Measurement.	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
<p>M.1.1 Provide instruction and experiences that address the vertical alignment of Measurement.</p> <p><i>Clarification 1:</i> Instruction includes, but is not limited to, number lines, measurement tools, formulas, estimation, mathematics vocabulary and problem-solving.</p> <p><i>Clarification 2:</i> Instruction includes connecting measurement relationships across grade or course levels to support progression of understanding</p> <p><i>Clarification 3:</i> Instruction includes, but is not limited to, engaging all learners in selecting and using appropriate measurement units and tools; representing and interpreting measurements using number lines, models and formulas; applying estimation and problem-solving to make sense of measurement situations; and using precise mathematics vocabulary to explain reasoning.</p>	
Description of Assignment(s)	
Performance Indicator	
<p>M.1.2 Provide instruction and experiences that address the horizontal alignment of Measurement.</p> <p><i>Clarification 1:</i> Instruction includes making connections to additional Florida’s B.E.S.T. Standards.</p> <p><i>Clarification 2:</i> Instruction includes reading, writing, representing, and modeling measurement concepts appropriate to grade or course level; explaining the value of unknowns using concrete, pictorial and abstract representations; and demonstrating accurate measures.</p>	
Description of Assignment(s)	
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

<p>M.1.3 Understand the relationships and connections between units within and across measurement systems. <i>Clarification 1:</i> Instruction includes opportunities for all learners to accurately and efficiently perform operations based on grade- or course-level benchmarks, building toward mastery of measurement concepts. <i>Clarification 2:</i> Instruction includes opportunities for all learners to select appropriate strategies based on content and context of the task or item; explain relationships between units of measure, length, mass, money, area, perimeter and time; and adapt all learners’ chosen procedures to new concepts.</p>	
Description of Assignment(s)	
Standard	
<p>M.2: Planning for Learning and Teaching within Measurement Teachers demonstrate strategies that support all learners in the learning and teaching of Measurement through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify possible student misconceptions and provide tiered instruction to support all learners.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
<p>M.2.1 Provide instruction and experiences that focus on student learning. <i>Clarification 1:</i> Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs. <i>Clarification 2:</i> Instruction includes applying various instructional approaches, based on multiple data points, to support all learners in the development and application of Measurement skills. <i>Clarification 3:</i> Instruction includes implementing evidence-based practices for learners with deficiencies, aligned to their strengths and needs to support their mastery in Measurement. <i>Clarification 4:</i> Refer to the Florida Mathematics Endorsement Glossary for assessment types and instructional approaches. <i>Clarification 5:</i> Refer to Florida’s B.E.S.T. Instructional Guide for Mathematics Intervention.</p>	
Description of Assignment(s)	
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

<p>M.2.2 Integrate the use of appropriate manipulatives, technological tools and resources into instruction to support all learners’ development of mathematical language and content knowledge within Measurement. <i>Clarification 1:</i> Manipulatives and tools may include, but are not limited to, number lines, rulers, measuring tapes, scales, clocks, protractors, grid paper, unit tiles and containers to aid all learners in their understanding of Measurement. <i>Clarification 2:</i> Technological tools and resources include, but are not limited to, virtual manipulatives, calculators and mathematics-specific dynamic software. <i>Clarification 3:</i> Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Measurement.</p>
Description of Assignment(s)
Performance Indicator
<p>M.2.3 Plan for and provide problem-solving opportunities associated with Measurement, providing feedback to support conceptual understanding and fluency. <i>Clarification 1:</i> Instruction includes engaging all learners in problem-solving experiences involving measurement, making use of patterns and structures, applying reading strategies, and explaining reasoning, using precise mathematics vocabulary. <i>Clarification 2:</i> Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare and refine solution strategies within measurement contexts.</p>
Description of Assignment(s)
Performance Indicator
<p>M.2.4 Create a learning environment where all learners practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems. <i>Clarification 1:</i> Instruction includes solving problems involving measurement using application of relevant operations. Refer to Situations Involving Operations with Numbers (Appendix A). <i>Clarification 2:</i> Instruction includes representing thinking in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations. <i>Clarification 3:</i> Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle. <i>Clarification 4:</i> Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying their thinking and reasoning.</p>
Description of Assignment(s)
Performance Indicator

MATHEMATICS ENDORSEMENT (K-12) MATRIX

M.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within Measurement. <i>Clarification 1:</i> Instruction includes all learners predicting results by estimating measurements in both non-standard and standard units during the process of solving problems. <i>Clarification 2:</i> Instruction includes all learners reflecting on and determining whether answers make sense given the context and revising solutions when results are unreasonable. <i>Clarification 3:</i> Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.	
Description of Assignment(s)	
Standard	
M.3: Assessment within Measurement Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
M.3.1 Provide knowledge of the five types of assessments. <i>Clarification 1:</i> The five types of assessments are diagnostic, screening, progress monitoring, formative and summative. <i>Clarification 2:</i> Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.	
Description of Assignment(s)	
Performance Indicator	
M.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners. <i>Clarification 1:</i> Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks. <i>Clarification 2:</i> Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners.	
Description of Assignment(s)	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Performance Indicator
M.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics. <i>Clarification 1:</i> Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.
Description of Assignment(s)

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Strand: Geometric Reasoning (GR)	
Standard	
GR.1: Vertical and Horizontal Alignment within Geometric Reasoning Teachers demonstrate strategies that support all students in the progression of content within Geometric Reasoning.	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
GR.1.1 Provide instruction and experiences that address the vertical alignment of Geometric Reasoning. <i>Clarification 1:</i> Instruction includes, but is not limited to, drawings, nets, measurement tools, estimation, fluency, mathematics vocabulary and problem solving. <i>Clarification 2:</i> Instruction includes connecting geometric concepts across grade or course levels to support progression of understanding. <i>Clarification 3:</i> Instruction includes, but is not limited to, engaging all learners in representing and analyzing geometric figures using drawings, nets and models; selecting and using appropriate measurement tools; applying estimation and computational fluency to geometric contexts; and using precise mathematics vocabulary to describe attributes and relationships, and to solve problems.	
Description of Assignment(s)	
Performance Indicator	
GR.1.2 Provide instruction and experiences that address the horizontal alignment of Geometric Reasoning. <i>Clarification 1:</i> Instruction includes making connections to additional Florida’s B.E.S.T. Standards. <i>Clarification 2:</i> Instruction includes, but is not limited to, reading, writing, representing and modeling geometric	
Description of Assignment(s)	
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

<p>GR.1.3 Understand the relationships and connections between points, lines, angles, two-dimensional, three-dimensional figures and postulates. <i>Clarification 1:</i> Instruction includes opportunities for all learners to select appropriate strategies based on the content and context of the task or item; explain relationships between algebraic and geometric representations; and adapt procedures to new concepts.</p>	
Description of Assignment(s)	
Standard	
<p>GR.2: Planning for Learning and Teaching within Geometric Reasoning Teachers demonstrate strategies that support all learners in the learning and teaching of Geometric Reasoning through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify possible student misconceptions and tiered instruction.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
<p>GR.2.1 Provide instruction and experiences that focus on student learning. <i>Clarification 1:</i> Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs. <i>Clarification 2:</i> Instruction includes applying various instructional approaches, based on multiple data points, to support students in the development of Geometric Reasoning skills. <i>Clarification 3:</i> Instruction includes implementing evidence-based practices for students with deficiencies, aligned to their strengths and needs to support their mastery in Geometric Reasoning. <i>Clarification 4:</i> Refer to the Florida Mathematics Endorsement Glossary for assessment types and instructional approaches. <i>Clarification 5:</i> Refer to Florida’s B.E.S.T. Instructional Guide for Mathematics Intervention.</p>	
Description of Assignment(s)	
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

<p>GR.2.2 Integrate the use of applicable manipulatives and technological tools and resources into instruction to support all learners’ development of mathematical language and content knowledge within Geometric Reasoning. <i>Clarification 1:</i> Manipulatives and tools include, but are not limited to, pattern blocks, patty paper, geometric solids, geoboards, diagrams and graphic organizers to aid all learners in their understanding of Geometric Reasoning. <i>Clarification 2:</i> Technological tools and resources include, but are not limited to, virtual manipulatives, calculators and mathematics-specific dynamic software. <i>Clarification 3:</i> Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Geometric Reasoning.</p>
Description of Assignment(s)
Performance Indicator
<p>GR.2.3 Plan and provide problem-solving opportunities associated with Geometric Reasoning, providing feedback to support conceptual understanding and fluency. <i>Clarification 1:</i> Instruction includes engaging all learners in problem-solving experiences involving geometric reasoning, making use of patterns and structures, applying reading strategies, and explaining their reasoning using precise mathematical vocabulary. <i>Clarification 2:</i> Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare and refine solution strategies within geometric contexts.</p>
Description of Assignment(s)
Performance Indicator
<p>GR.2.4 Create a learning environment where students practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems. <i>Clarification 1:</i> Instruction includes solving problems involving geometric reasoning using the application of relevant operations. <i>Clarification 2:</i> Instruction includes representing thinking in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations. <i>Clarification 3:</i> Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle. <i>Clarification 4:</i> Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying their thinking and reasoning.</p>
Description of Assignment(s)
Performance Indicator

MATHEMATICS ENDORSEMENT (K-12) MATRIX

GR.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within Geometric Reasoning.
Clarification 1: Instruction includes all learners predicting results by estimating quantities using numerical benchmarks and number relationships and monitoring calculations, procedures and intermediate results during the process of solving problems.
Clarification 2: Instruction includes all learners reflecting on and determining whether answers make sense given the context and revising solutions when results are unreasonable.
Clarification 3: Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.

Description of Assignment(s)

Standard

GR.3: Assessment within Geometric Reasoning
 Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.

Description of Assignment(s)

Description of Assessment(s)

Assignment(s):

Assessment(s):

Performance Indicator

GR.3.1 Provide knowledge of the five types of assessments.
Clarification 1: The five types of assessments are diagnostic, screening, progress monitoring, formative and summative.
Clarification 2: Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.

Description of Assignment(s)

Performance Indicator

GR.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners.
Clarification 1: Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks.
Clarification 2: Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners.
Clarification 3: Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Description of Assignment(s)
Performance Indicator
GR.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics. <i>Clarification 1:</i> Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.
Description of Assignment(s)

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Strand: Data Analysis and Probability (DP)	
Standard	
DP.1: Vertical and Horizontal Alignment within Data Analysis and Probability Teachers demonstrate strategies that support all students in the progression of content within Data Analysis and Probability.	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	
DP.1.1 Provide instruction and experiences that address the vertical alignment of Data Analysis and Probability. <i>Clarification 1:</i> Instruction includes, but is not limited to, providing students with time and opportunities to practice and gain an understanding of collecting and representing data of various forms across grade or course level. <i>Clarification 2:</i> Instruction includes connecting data and probability concepts across grade or course levels to support progression of understanding. <i>Clarification 3:</i> Instruction includes, but is not limited to, engaging all learners in making connections, analyzing and interpreting data of various forms; using appropriate representations and tools; applying estimation and reasoning in probabilistic contexts; and using precise mathematics vocabulary to explain conclusions and solve problems.	
Description of Assignment(s)	
Performance Indicator	
DP.1.1 Provide instruction and experiences that address the vertical alignment of Data Analysis and Probability. <i>Clarification 1:</i> Instruction includes, but is not limited to, providing students with time and opportunities to practice and gain an understanding of collecting and representing data of various forms across grade or course level. <i>Clarification 2:</i> Instruction includes connecting data and probability concepts across grade or course levels to support progression of understanding. <i>Clarification 3:</i> Instruction includes, but is not limited to, engaging all learners in making connections, analyzing and interpreting data of various forms; using appropriate representations and tools; applying estimation and reasoning in probabilistic contexts; and using precise mathematics vocabulary to explain conclusions and solve problems.	
Description of Assignment(s)	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Performance Indicator	
<p>DP.1.2 Provide instruction and experiences that address the horizontal alignment of Data Analysis and Probability. <i>Clarification 1:</i> Instruction includes making connections to additional Florida B.E.S.T. Standards. <i>Clarification 2:</i> Instruction includes providing students with time and opportunities to practice and gain an understanding of collecting and representing data of various forms within grade or course level. <i>Clarification 3:</i> Instruction includes providing students with time and opportunities to make connections, analyze and interpret data of various forms within grade or course level.</p>	
Description of Assignment(s)	
Performance Indicator	
<p>DP.1.3 Understand the relationships and connections between data types, including probabilities and graphical representations. <i>Clarification 1:</i> Instruction includes opportunities for all learners to select appropriate strategies based on the content and context of the task or item; explain relationships between data analysis and probability, including connections between numerical representations; and adapt students’ chosen procedures to new concepts.</p>	
Description of Assignment(s)	
Standard	
<p>DP.2: Planning for Learning and Teaching within Data Analysis and Probability Teachers demonstrate strategies that support all students in the learning and teaching of Data Analysis and Probability through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify possible student misconceptions and tiered instruction.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

<p>DP.2.1 Provide instruction and experiences that focus on student learning.</p> <p><i>Clarification 1:</i> Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs.</p> <p><i>Clarification 2:</i> Instruction includes implementing balanced instructional approaches, based on multiple data points, to support students in the development of Data Analysis and Probability skills.</p> <p><i>Clarification 3:</i> Instruction includes implementing evidence-based practices for students with deficiencies, aligned to their strengths and needs to support their mastery in Data Analysis and Probability.</p> <p><i>Clarification 4:</i> Refer to the Florida Mathematics Endorsement Glossary for assessment types and instructional approaches.</p> <p><i>Clarification 5:</i> Refer to Florida’s B.E.S.T. Instructional Guide for Mathematics Intervention.</p>
Description of Assignment(s)
Performance Indicator
<p>DP.2.2 Integrate the use of applicable manipulatives, technological tools and resources into instruction to support all learners’ development of mathematical language and content knowledge within Data Analysis and Probability.</p> <p><i>Clarification 1:</i> Manipulatives and tools include, but are not limited to, number lines, tables, diagrams and graphic organizers to aid all learners in their understanding of Data Analysis and Probability.</p> <p><i>Clarification 2:</i> Technological tools and resources include, but are not limited to, virtual manipulatives, calculators and mathematics-specific dynamic software.</p> <p><i>Clarification 3:</i> Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Data Analysis and Probability.</p>
Description of Assignment(s)
Performance Indicator
<p>DP.2.3 Plan and provide problem-solving opportunities associated with Data Analysis and Probability, providing feedback to support conceptual understanding and fluency.</p> <p><i>Clarification 1:</i> Instruction includes engaging all learners in problem-solving experiences involving data analysis and probability, making use of patterns and structures, applying reading strategies and explaining their reasoning using precise mathematical vocabulary.</p> <p><i>Clarification 2:</i> Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare, and refine solution strategies within data analysis and probability contexts.</p>
Description of Assignment(s)

MATHEMATICS ENDORSEMENT (K-12) MATRIX

Performance Indicator	
<p>DP.2.4 Create a learning environment where students practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.</p> <p><i>Clarification 1:</i> Instruction includes solving problems involving data analysis and probability using the application of relevant operations.</p> <p><i>Clarification 2:</i> Instruction includes representing thinking in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations.</p> <p><i>Clarification 3:</i> Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle.</p> <p><i>Clarification 4:</i> Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying their thinking and reasoning.</p>	
Description of Assignment(s)	
Performance Indicator	
<p>DP.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within teaching Data Analysis and Probability.</p> <p><i>Clarification 1:</i> Instruction includes all learners predicting results by estimating quantities using numerical benchmarks and number relationships; and monitoring calculations, procedures and intermediate results during the process of solving problems.</p> <p><i>Clarification 2:</i> Instruction includes all learners reflecting on and determining whether answers make sense given the context and revising solutions when results are unreasonable.</p> <p><i>Clarification 3:</i> Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.</p>	
Description of Assignment(s)	
Standard	
<p>DP.3: Assessment within Data Analysis and Probability</p> <p>Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.</p>	
Description of Assignment(s)	Description of Assessment(s)
Assignment(s):	Assessment(s):
Performance Indicator	

MATHEMATICS ENDORSEMENT (K-12) MATRIX

<p>DP.3.1 Provide knowledge of the five types of assessments. <i>Clarification 1:</i> The five types of assessments are diagnostic, screening, progress monitoring, formative and summative. <i>Clarification 2:</i> Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.</p>
Description of Assignment(s)
Performance Indicator
<p>DP.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners. <i>Clarification 1:</i> Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks. <i>Clarification 2:</i> Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners. <i>Clarification 3:</i> Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.</p>
Description of Assignment(s)
Performance Indicator
<p>DP.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics. <i>Clarification 1:</i> Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.</p>
Description of Assignment(s)



Florida Mathematics Endorsement (K-12) Competencies 2026

Guiding Principles, Purpose and Vision

The Florida Mathematics Endorsement (K-12) Competencies 2026 are aligned with evidence-based tiered instructional strategies informed by Florida's Formula for Success. The competencies address the strands within the Benchmarks for Excellent Student Thinking (B.E.S.T.) Standards for Mathematics including Number Sense and Operations, Fractions, Algebraic Reasoning and Functions, Measurement, Geometric Reasoning, and Data Analysis and Probability. The elements of Florida's Formula for Success are integrated throughout the Florida Mathematics Endorsement (K-12) Competencies 2026 by focusing on five characteristics of benchmarks-aligned, high-quality instruction (horizontal and vertical alignment, balanced instructional approaches, planning for student learning, instruction informed by data, implementing tiered instruction); five types of assessment (screening, progress monitoring, diagnostic, summative, formative); and instruction that is accessible for all students (Tier 1), supplemental instruction and intervention for some students (Tier 2), and intensive instruction and intervention for few students (Tier 3).

Teachers will understand and deliver evidence-based tiered instructional strategies, ensuring accessibility for all learners. The Florida Mathematics Endorsement (K-12) indicates that a teacher has attained additional professional knowledge of mathematics content and evidence-based instructional practice at the level they are certified to teach. This add-on credential ensures that teachers possess a comprehensive understanding of specialized mathematics instruction with Number Sense and Operations, Fractions, Algebraic Reasoning and Functions, Measurement, Geometric Reasoning, and Data Analysis, and Probability. Through this endorsement, teachers will acquire additional professional preparation in tiered mathematics instruction. The teacher will have the knowledge and ability to effectively identify, develop and implement benchmarks-aligned, high-quality instruction to support learners in their development of conceptual understanding; address student misconceptions; and cultivate mathematical thinking, reasoning and problem-solving skills.

The Mathematical Thinking and Reasoning Standards (MTRs) (Appendix B), and elements of the B.E.S.T. Instructional Guides for Mathematics (B1G-M) and the B.E.S.T. Instructional Guides for Mathematics Intervention (B1G-MI) are integrated throughout the Mathematics Endorsement (K-12) Competencies 2026. Also, refer to Situations Involving Operations with Numbers (Appendix A) found at the end of this document.

The [Florida Mathematics Endorsement \(K-12\) Glossary](#) is included at the end of this document. This glossary is not intended to comprise a comprehensive vocabulary list. The Florida Department of Education (FDOE) recognizes that there may be alternative definitions for some terms; however, the intention here is to provide a common language and shared understanding among all stakeholders in the state of Florida.



Florida Mathematics Endorsement (K-12) Competencies 2026 Coding Scheme

Florida has a unique coding scheme defined by 3-character places in an alphanumeric coding: the strand, standard and performance indicator. The strand, also commonly called competency, is a focal group of related standards. Standards are overarching criteria within that strand. The performance indicator is a specific expectation that falls within the standard.

Examples of Coding Scheme

<i>Strand</i>	<i>Standard</i>	<i>Performance Indicator</i>
NSO. Number Sense and Operations (NSO)	1. Vertical and Horizontal Alignment within Number Sense and Operations	3 Understand the continuum of arithmetic operations consisting of exploration, procedural reliability, procedural fluency and automaticity.
FR. Fractions (FR)	2. Planning for Learning and Teaching within Fractions	1 Provide instruction and experiences that focus on student learning.
DP. Data Analysis and Probability	3. Assessment within Data Analysis and Probability	2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners.



Florida Mathematics Endorsement (K-12) Competencies 2026

Strand (Competency): Number Sense and Operations (NSO)

Standard 1 | NSO.1: Vertical and Horizontal Alignment within Number Sense and Operations
Teachers demonstrate strategies that support all learners in the progression of content within Number Sense and Operations.

Performance Indicators

NSO.1.1 Provide instruction and experiences that address the vertical alignment of Number Sense and Operations.

Clarification 1: Instruction includes, but is not limited to, place value and base ten, flexible number representation, estimation, computational fluency, properties of operations, mathematics vocabulary, and problem solving within all number systems.

Clarification 2: Instruction includes connecting number relationships across grade or course levels to support progression of understanding.

Clarification 3: Instruction includes, but is not limited to, engaging all learners in representing numbers in multiple ways, explaining place-value relationships and applying properties of operations to solve problems across multiple number systems.

NSO.1.2 Provide instruction and experiences that address the horizontal alignment of Number Sense and Operations.

Clarification 1: Instruction includes making connections to additional Florida's B.E.S.T. Standards.

Clarification 2: Instruction includes reading, writing, representing and modeling numbers appropriate to grade or course level; explaining the value of digits based on place using concrete, pictorial and abstract representations; composing and decomposing numbers flexibly; and comparing, ordering and reasoning about numbers.

NSO.1.3 Understand the continuum of arithmetic operations consisting of exploration, procedural reliability, procedural fluency and automaticity.

Clarification 1: Instruction includes opportunities for all learners to accurately and efficiently perform operations based upon grade- or course-level benchmarks, building toward fluency through reasoning and structure.

Clarification 2: Instruction includes opportunities for all learners to select appropriate strategies based on content and context of the task or item, explain relationships between operations, and adapt all learners' chosen procedures to new concepts.

Standard 2 | NSO.2: Planning for Learning and Teaching within Number Sense and Operations
Teachers demonstrate strategies that support all learners in the learning and teaching of Number Sense and Operations through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify possible student misconceptions and provide tiered instruction to support all learners.



Performance Indicators

NSO.2.1 Provide instruction and experiences that focus on student learning.

Clarification 1: Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs.

Clarification 2: Instruction includes implementing various instructional approaches, based on multiple data points, to support all learners in the development and application of Number Sense and Operations skills.

Clarification 3: Instruction includes implementing evidence-based practices for learners with deficiencies, aligned to their strengths and needs to support their mastery in Number Sense and Operations.

Clarification 4: Refer to the Florida Mathematics Endorsement (K-12) Glossary for assessment types and instructional approaches.

Clarification 5: Refer to Florida's B.E.S.T. Instructional Guide for Mathematics Intervention.

NSO.2.2 Integrate the use of appropriate manipulatives, technological tools and resources into instruction to support all learners' development of mathematical language and content knowledge within Number Sense and Operations.

Clarification 1: Manipulatives and tools include, but are not limited to, number lines, ten frames, arrays, base-ten blocks, place-value charts, integer chips, algebra tiles, geoboards, measurement tools, equation strips, diagrams and graphic organizers to aid all learners in their understanding of Number Sense and Operations.

Clarification 2: Technological tools and resources include, but are not limited to, virtual manipulatives, calculators and mathematics-specific dynamic software.

Clarification 3: Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Number Sense and Operations.

NSO.2.3 Plan for and provide problem-solving opportunities associated with Number Sense and Operations, providing feedback to support conceptual understanding and fluency.

Clarification 1: Instruction includes engaging all learners in problem-solving experiences, making use of patterns and structures, applying reading strategies, and explaining learners' reasoning.

Clarification 2: Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify and compare solution strategies.

NSO.2.4 Create a learning environment where all learners practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.

Clarification 1: Instruction includes solving problems using the application of relevant operations. Refer to Situations Involving Operations with Numbers (Appendix A).

Clarification 2: Instruction includes representing problems in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations.

Clarification 3: Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle.



Clarification 4: Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying learners' thinking and reasoning.

NSO.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within Number Sense and Operations.

Clarification 1: Instruction includes all learners predicting results by estimating quantities using numerical benchmarks and number relationships, and monitoring calculations, procedures and intermediate results during the process of solving problems.

Clarification 2: Instruction includes all learners reflecting on and determining whether answers make sense given the context, and revising solutions when results are unreasonable.

Clarification 3: Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.

Standard 3 | NSO.3: Assessment within Number Sense and Operations

Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.

Performance Indicators

NSO.3.1 Provide knowledge of the five types of assessments.

Clarification 1: The five types of assessments are diagnostic, screening, progress monitoring, formative and summative.

Clarification 2: Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.

NSO.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners.

Clarification 1: Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks.

Clarification 2: Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners.

Clarification 3: Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.

NSO.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics.

Clarification 1: Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.



Strand (Competency): Fractions (FR)

Standard 1 | FR.1: Vertical and Horizontal Alignment within Fractions

Teachers demonstrate strategies that support all students in the progression of content within Fractions.

Performance Indicators

FR.1.1 Provide instruction and experiences that address the vertical alignment of Fractions.

Clarification 1: Instruction includes, but is not limited to, number lines, flexible number representation (mixed numbers and fractions greater than one), estimation, computational fluency, properties of operations, mathematics vocabulary and problem solving within all number systems.

Clarification 2: Instruction includes connecting fractions across grade or course levels to support progression of understanding. Instruction includes progression from unit fractions as equal parts of a whole or set; to representing fractions as numbers on a number line; to generating, comparing and reasoning about equivalent fractions; and to fractions in real-world contexts.

Clarification 3: Instruction includes, but is not limited to, engaging all learners in representing fractions in multiple ways (including number lines and flexible representations such as mixed numbers and fractions greater than one), using estimation and computational fluency to make sense of fraction operations, applying properties of operations, and using precise mathematics vocabulary to explain reasoning and solve problems within all number systems.

FR.1.2 Provide instruction and experiences that address the horizontal alignment of Fractions.

Clarification 1: Instruction includes making connections to additional Florida's B.E.S.T. Standards.

Clarification 2: Instruction includes reading, writing, representing and modeling numbers appropriate to grade or course level; explaining the value of digits based on place using concrete, pictorial and abstract representations; composing and decomposing numbers flexibly; and comparing, ordering and reasoning about numbers.

FR.1.3 Understand the continuum of operations with fractions, consisting of exploration, procedural reliability, procedural fluency and automaticity.

Clarification 1: Instruction includes opportunities for all learners to accurately and efficiently perform operations based on grade- or course-level benchmarks, building fluency through reasoning and structure.

Clarification 2: Instruction includes opportunities for all learners to select appropriate strategies based on content and context of the task or item, explain relationships between operations, and adapt all learners' chosen procedures to new concepts.

Standard 2 | FR.2: Planning for Learning and Teaching within Fractions

Teachers demonstrate strategies that support all learners in the learning and teaching of Fractions through the lens of the Mathematical Thinking and Reasoning Standards (MTRs).



Teachers will also identify possible student misconceptions and provide tiered instruction to support all learners.

Performance Indicators

FR.2.1 Provide instruction and experiences that focus on student learning.

Clarification 1: Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs.

Clarification 2: Instruction includes applying various instructional approaches, based on multiple data points, to support student development of fractions concepts.

Clarification 3: Instruction includes implementing evidence-based practices for learners with deficiencies, aligned to their strengths and needs to support their mastery in fractions.

Clarification 4: Refer to the Florida Mathematics Endorsement (K-12) Glossary for assessment types and instructional approaches.

Clarification 5: Refer to Florida's B.E.S.T. Instructional Guide for Mathematics Intervention.

FR.2.2 Integrate the use of appropriate manipulatives, technological tools and resources into instruction to support all learners' development of mathematical language and content knowledge within Fractions.

Clarification 1: Manipulatives and tools include, but are not limited to, number lines, fraction tiles, diagrams and graphic organizers to aid all learners in their understanding of fractions.

Clarification 2: Technological tools and resources include, but are limited to, virtual manipulatives, calculators and mathematics-specific dynamic software.

Clarification 3: Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of fractions.

FR.2.3 Plan for and provide problem-solving opportunities associated with Fractions, providing feedback to support conceptual understanding and fluency.

Clarification 1: Instruction includes engaging all learners in problem-solving experiences with fractions, making use of patterns and structures, applying reading strategies, and explaining their reasoning using precise mathematics vocabulary.

Clarification 2: Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare and refine solution strategies within fractions contexts.

FR.2.4 Create a learning environment where all learners practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.

Clarification 1: Instruction includes solving problems using relevant operations and representing their thinking in multiple ways (i.e., manipulatives, equations, models, tables or diagrams), while explaining connections among representations.

Clarification 2: Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle.



Clarification 3: Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying their thinking and reasoning.

FR.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within Fractions.

Clarification 1: Instruction includes estimating quantities and results using fractional benchmarks and number relationships, determining whether answers make sense given the context, and revising solutions when results are unreasonable.

Clarification 2: Instruction includes students reflecting on and determining whether answers make sense given the context, and revising solutions when results are unreasonable.

Clarification 3: Instruction includes students providing explanations and justifications of their thinking and evaluating the thinking of others.

Standard 3 | FR.3: Assessment within Fractions

Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.

Performance Indicators

FR.3.1 Provide knowledge of the five types of assessments.

Clarification 1: The five types of assessments are diagnostic, screening, progress monitoring, formative and summative.

Clarification 2: Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.

FR.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners.

Clarification 1: Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks.

Clarification 2: Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners.

Clarification 3: Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.

FR.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or those who have a substantial deficiency in mathematics.

Clarification 1: Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.



Strand (Competency): Algebraic Reasoning and Functions (ARF)

Standard 1 | ARF.1: Vertical and Horizontal Alignment within Algebraic Reasoning and Functions

Teachers demonstrate strategies that support all learners in the progression of content within Algebraic Reasoning and Functions, integrating content knowledge from other strands (such as Number Sense and Operations).

Performance Indicators

ARF.1.1 Provide instruction and experiences that address the vertical alignment of Algebraic Reasoning and Functions:

Clarification 1: Instruction includes representing and solving problems using operations; explaining the meaning of the equal sign and equality; recognizing numerical patterns; analyzing input-output relationships; working with numerical and algebraic expressions and inequalities; generating equivalent equations and expressions; exploring relationships and proportional reasoning; solving systems of equations; graphing equations; and graphing and interpreting polynomial functions, including understanding properties and transformations of functions.

Clarification 2: Instruction includes connecting Algebraic Reasoning and Functions across grade or course level to support progression of understanding.

Clarification 3: Instruction includes, but is not limited to, engaging all learners in representing and solving problems using operations; explaining and justifying the meaning of the equal sign and equality; recognizing and analyzing numerical patterns and input-output relationships; working with and generating equivalent numerical and algebraic expressions, equations and inequalities; applying properties of operations; exploring relationships including proportional reasoning; solving systems of equations; and graphing, interpreting and analyzing equations and functions, including polynomial functions and their transformations, using precise mathematics vocabulary to communicate reasoning.

ARF.1.2 Provide instruction and experiences that address the horizontal alignment of Algebraic Reasoning and Functions.

Clarification 1: Instruction includes making connections to additional Florida's B.E.S.T. Standards for representing and solving problems using operations; explaining the meaning of the equal sign and equality; recognizing numerical patterns; analyzing input-output relationships; working with numerical and algebraic expressions and inequalities; generating equivalent equations and expressions; exploring relationships and proportional reasoning; solving systems of equations; graphing equations; and graphing and interpreting polynomial functions, including understanding properties and transformations of functions.

Clarification 2: Instructions include reading, writing, representing and modeling algebraic reasoning and function concepts appropriate to grade or course level using different representations (such as concrete, pictorial and abstract).



ARF.1.3 Understand the continuum of algebraic operations and functions, consisting of exploration, procedural reliability, procedural fluency and automaticity.

Clarification 1: Instruction includes opportunities for all learners to accurately and efficiently perform operations based upon grade- or course-level benchmarks, building toward fluency through reasoning and structure.

Clarification 2: Instruction includes opportunities for all learners to select appropriate strategies based on content and context of the task or item, explain relationships between operations, and adapt all learners' chosen procedures to new concepts.

Standard 2 | ARF.2: Planning for Learning and Teaching within Algebraic Reasoning and Functions

Teachers demonstrate strategies that support all students in the learning and teaching of Algebraic Reasoning and Functions through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify students' misconceptions and provide tiered instruction to support all learners.

Performance Indicators

ARF.2.1 Provide instruction and experiences that focus on student learning.

Clarification 1: Instruction includes administering and documenting appropriate assessments to inform instructional decisions, with consideration of individual student strengths and needs.

Clarification 2: Instruction includes implementing various instructional approaches, based on multiple data points, to support all learners in the development and application of Algebraic Reasoning and Functions.

Clarification 3: Instruction includes implementing evidence-based practices for learners with deficiencies, aligned to their strengths and needs to support mastering concepts of Algebraic Reasoning and Functions.

Clarification 4: Refer to the Florida Mathematics Endorsement (K-12) Glossary for assessment types and instructional approaches.

Clarification 5: Refer to Florida's B.E.S.T. Instructional Guide for Mathematics Intervention.

ARF.2.2. Integrate the use of appropriate manipulatives, technological tools and resources into instruction to support all learners' development of mathematical language and content knowledge within Algebraic Reasoning and Functions.

Clarification 1: Manipulatives include, but are not limited to, counters, connecting cubes, pattern blocks, algebra tiles, balance scales, individual dry-erase boards, arrays, diagrams and graphic organizers to support all learners in their understanding of Algebraic Reasoning and Functions.

Clarification 2: Technology tools and resources include, but are not limited to, classroom engagement tools, mathematics-specific dynamic software, calculators and virtual manipulatives.

Clarification 3: Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Algebraic Reasoning and Functions.



ARF.2.3 Plan for and provide problem-solving opportunities associated with Algebraic Reasoning and Functions, providing feedback to support conceptual understanding and fluency.

Clarification 1: Instruction includes engaging all learners in problem-solving experiences related to algebraic reasoning and functions, making use of patterns and structures, applying reading strategies, and explaining their reasoning using precise mathematics vocabulary.

Clarification 2: Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare and refine solution strategies within algebraic reasoning and function contexts.

Clarification 3: Instruction includes, but is not limited to, engaging all learners in representing unknown quantities; identifying and extending patterns; modeling relationships in multiple ways (i.e., tables, graphs, equations); interpreting relationships; understanding the meaning of quantities in context; and making connections across representations through tasks such as pattern exploration, real-world modeling tasks, systems of equations scenarios and function comparisons.

Clarification 4: Instruction includes providing constructive and guiding feedback that supports all learners' problem-solving habits, including reasoning, explanation, the use of multiple strategies and perseverance through productive struggle, while identifying specific areas for improvement.

ARF.2.4 Create a learning environment where all learners practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.

Clarification 1: Instruction includes problem-solving opportunities related to algebraic reasoning and functions using relevant operations and representing thinking in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations.

Clarification 2: Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle.

Clarification 3: Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying their thinking and reasoning.

ARF.2.5 Demonstrate a conceptual understanding to describe and analyze relationships between concepts within Algebraic Reasoning and Functions.

Clarification 1: Instruction includes all learners predicting and justifying results by analyzing patterns, relationships and functions, and evaluating the reasonableness throughout the problem-solving process.

Clarification 2: Instruction includes all learners reflecting and determining whether answers make sense in context and revising solutions when results are unreasonable.

Clarification 3: Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.



Standard 3 | ARF.3: Assessment within Number Sense and Operations

Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.

Performance Indicators

ARF.3.1 Provide knowledge of the five types of assessments.

Clarification 1: The five types of assessments are diagnostic, screening, progress monitoring, formative and summative.

Clarification 2: Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.

ARF.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners.

Clarification 1: Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks.

Clarification 2: Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners.

Clarification 3: Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.

ARF.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics.

Clarification 1: Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.



Strand (Competency): Measurement (M)

Standard 1 | M.1: Vertical and Horizontal Alignment within Measurement

Teachers demonstrate strategies that support all learners in the progression of content within Measurement.

Performance Indicators

M.1.1 Provide instruction and experiences that address the vertical alignment of Measurement.

Clarification 1: Instruction includes, but is not limited to, number lines, measurement tools, formulas, estimation, mathematics vocabulary and problem-solving.

Clarification 2: Instruction includes connecting measurement relationships across grade or course levels to support progression of understanding

Clarification 3: Instruction includes, but is not limited to, engaging all learners in selecting and using appropriate measurement units and tools; representing and interpreting measurements using number lines, models and formulas; applying estimation and problem-solving to make sense of measurement situations; and using precise mathematics vocabulary to explain reasoning.

M.1.2 Provide instruction and experiences that address the horizontal alignment of Measurement.

Clarification 1: Instruction includes making connections to additional Florida's B.E.S.T. Standards.

Clarification 2: Instruction includes reading, writing, representing, and modeling measurement concepts appropriate to grade or course level; explaining the value of unknowns using concrete, pictorial and abstract representations; and demonstrating accurate measures.

M.1.3 Understand the relationships and connections between units within and across measurement systems.

Clarification 1: Instruction includes opportunities for all learners to accurately and efficiently perform operations based on grade- or course-level benchmarks, building toward mastery of measurement concepts.

Clarification 2: Instruction includes opportunities for all learners to select appropriate strategies based on content and context of the task or item; explain relationships between units of measure, length, mass, money, area, perimeter and time; and adapt all learners' chosen procedures to new concepts.

Standard 2 | M.2: Planning for Learning and Teaching within Measurement

Teachers demonstrate strategies that support all learners in the learning and teaching of Measurement through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify possible student misconceptions and provide tiered instruction to support all learners.



Performance Indicators

M.2.1 Provide instruction and experiences that focus on student learning.

Clarification 1: Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs.

Clarification 2: Instruction includes applying various instructional approaches, based on multiple data points, to support all learners in the development and application of Measurement skills.

Clarification 3: Instruction includes implementing evidence-based practices for learners with deficiencies, aligned to their strengths and needs to support their mastery in Measurement.

Clarification 4: Refer to the Florida Mathematics Endorsement (K-12) Glossary for assessment types and instructional approaches.

Clarification 5: Refer to Florida's B.E.S.T. Instructional Guide for Mathematics Intervention.

M.2.2 Integrate the use of appropriate manipulatives, technological tools and resources into instruction to support all learners' development of mathematical language and content knowledge within Measurement.

Clarification 1: Manipulatives and tools may include, but are not limited to, number lines, rulers, measuring tapes, scales, clocks, protractors, grid paper, unit tiles and containers to aid all learners in their understanding of Measurement.

Clarification 2: Technological tools and resources include, but are not limited to, virtual manipulatives, calculators and mathematics-specific dynamic software.

Clarification 3: Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Measurement.

M.2.3 Plan for and provide problem-solving opportunities associated with Measurement, providing feedback to support conceptual understanding and fluency.

Clarification 1: Instruction includes engaging all learners in problem-solving experiences involving measurement, making use of patterns and structures, applying reading strategies, and explaining reasoning use precise mathematics vocabulary.

Clarification 2: Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare and refine solution strategies within measurement contexts.

M.2.4 Create a learning environment where all learners practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.

Clarification 1: Instruction includes solving problems involving measurement using application of relevant operations. Refer to Situations Involving Operations with Numbers (Appendix A).

Clarification 2: Instruction includes representing thinking in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations.

Clarification 3: Instruction includes making connections to prior learning and known



strategies, as well as persevering through productive struggle.

Clarification 4: Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying their thinking and reasoning.

M.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within Measurement.

Clarification 1: Instruction includes all learners predicting results by estimating measurements in both non-standard and standard units during the process of solving problems.

Clarification 2: Instruction includes all learners reflecting on and determining whether answers make sense given the context and revising solutions when results are unreasonable.

Clarification 3: Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.

Standard 3 | M.3: Assessment within Measurement

Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.

Performance Indicators

M.3.1 Provide knowledge of the five types of assessments.

Clarification 1: The five types of assessments are diagnostic, screening, progress monitoring, formative and summative.

Clarification 2: Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.

M.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners.

Clarification 1: Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks.

Clarification 2: Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners.

Clarification 3: Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.

M.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics.

Clarification 1: Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.



Strand (Competency): Geometric Reasoning (GR)

Standard 1 | GR.1: Vertical and Horizontal Alignment within Geometric Reasoning

Teachers demonstrate strategies that support all students in the progression of content within Geometric Reasoning.

Performance Indicators

GR.1.1 Provide instruction and experiences that address the vertical alignment of Geometric Reasoning.

Clarification 1: Instruction includes, but is not limited to, drawings, nets, measurement tools, estimation, fluency, mathematics vocabulary and problem solving.

Clarification 2: Instruction includes connecting geometric concepts across grade or course levels to support progression of understanding.

Clarification 3: Instruction includes, but is not limited to, engaging all learners in representing and analyzing geometric figures using drawings, nets and models; selecting and using appropriate measurement tools; applying estimation and computational fluency to geometric contexts; and using precise mathematics vocabulary to describe attributes and relationships, and to solve problems.

GR.1.2 Provide instruction and experiences that address the horizontal alignment of Geometric Reasoning.

Clarification 1: Instruction includes making connections to additional Florida's B.E.S.T. Standards.

Clarification 2: Instruction includes, but is not limited to, reading, writing, representing and modeling geometric concepts appropriate to grade or course level; explaining the value of unknown values using concrete, pictorial and abstract representations; and developing geometric concepts flexibly.

GR.1.3 Understand the relationships and connections between points, lines, angles, two-dimensional, three-dimensional figures and postulates.

Clarification 1: Instruction includes opportunities for all learners to select appropriate strategies based on the content and context of the task or item; explain relationships between algebraic and geometric representations; and adapt procedures to new concepts.

Standard 2 | GR.2: Planning for Learning and Teaching within Geometric Reasoning

Teachers demonstrate strategies that support all learners in the learning and teaching of Geometric Reasoning through the lens of the Mathematical Thinking and Reasoning Standards (MTRs).

Teachers will also identify possible student misconceptions and tiered instruction.

Performance Indicators

GR.2.1 Provide instruction and experiences that focus on student learning.

Clarification 1: Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs.



Clarification 2: Instruction includes applying various instructional approaches, based on multiple data points, to support students in the development of Geometric Reasoning skills.

Clarification 3: Instruction includes implementing evidence-based practices for students with deficiencies, aligned to their strengths and needs to support their mastery in Geometric Reasoning.

Clarification 4: Refer to the Florida Mathematics Endorsement (K-12) Glossary for assessment types and instructional approaches.

Clarification 5: Refer to Florida's B.E.S.T. Instructional Guide for Mathematics Intervention.

GR.2.2 Integrate the use of applicable manipulatives and technological tools and resources into instruction to support all learners' development of mathematical language and content knowledge within Geometric Reasoning.

Clarification 1: Manipulatives and tools include, but are not limited to, pattern blocks, patty paper, geometric solids, geoboards, diagrams and graphic organizers to aid all learners in their understanding of Geometric Reasoning.

Clarification 2: Technological tools and resources include, but are not limited to, virtual manipulatives, calculators and mathematics-specific dynamic software.

Clarification 3: Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Geometric Reasoning.

GR.2.3 Plan and provide problem-solving opportunities associated with Geometric Reasoning, providing feedback to support conceptual understanding and fluency.

Clarification 1: Instruction includes engaging all learners in problem-solving experiences involving geometric reasoning, making use of patterns and structures, applying reading strategies, and explaining their reasoning using precise mathematical vocabulary.

Clarification 2: Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare and refine solution strategies within geometric contexts.

GR.2.4 Create a learning environment where students practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.

Clarification 1: Instruction includes solving problems involving geometric reasoning using the application of relevant operations.

Clarification 2: Instruction includes representing thinking in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations.

Clarification 3: Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle.

Clarification 4: Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying their thinking and reasoning.



GR.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within Geometric Reasoning.

Clarification 1: Instruction includes all learners predicting results by estimating quantities using numerical benchmarks and number relationships and monitoring calculations, procedures and intermediate results during the process of solving problems.

Clarification 2: Instruction includes all learners reflecting on and determining whether answers make sense given the context and revising solutions when results are unreasonable.

Clarification 3: Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.

Standard 3 | GR.3: Assessment within Geometric Reasoning

Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.

Performance Indicators

GR.3.1 Provide knowledge of the five types of assessments.

Clarification 1: The five types of assessments are diagnostic, screening, progress monitoring, formative and summative.

Clarification 2: Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.

GR.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners.

Clarification 1: Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks.

Clarification 2: Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners.

Clarification 3: Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.

GR.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics.

Clarification 1: Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.



Strand (Competency): Data Analysis and Probability (DP)

Standard 1 | DP.1: Vertical and Horizontal Alignment within Data Analysis and Probability

Teachers demonstrate strategies that support all students in the progression of content within Data Analysis and Probability.

Performance Indicators

DP.1.1 Provide instruction and experiences that address the vertical alignment of Data Analysis and Probability.

Clarification 1: Instruction includes, but is not limited to, providing students with time and opportunities to practice and gain an understanding of collecting and representing data of various forms across grade or course level.

Clarification 2: Instruction includes connecting data and probability concepts across grade or course levels to support progression of understanding.

Clarification 3: Instruction includes, but is not limited to, engaging all learners in making connections, analyzing and interpreting data of various forms; using appropriate representations and tools; applying estimation and reasoning in probabilistic contexts; and using precise mathematics vocabulary to explain conclusions and solve problems.

DP.1.2 Provide instruction and experiences that address the horizontal alignment of Data Analysis and Probability.

Clarification 1: Instruction includes making connections to additional Florida B.E.S.T. Standards.

Clarification 2: Instruction includes providing students with time and opportunities to practice and gain an understanding of collecting and representing data of various forms within grade or course level.

Clarification 3: Instruction includes providing students with time and opportunities to make connections, analyze and interpret data of various forms within grade or course level.

DP.1.3 Understand the relationships and connections between data types, including probabilities and graphical representations.

Clarification 1: Instruction includes opportunities for all learners to select appropriate strategies based on the content and context of the task or item; explain relationships between data analysis and probability, including connections between numerical representations; and adapt students' chosen procedures to new concepts.

Standard 2 | DP.2: Planning for Learning and Teaching within Data Analysis and Probability

Teachers demonstrate strategies that support all students in the learning and teaching of Data Analysis and Probability through the lens of the Mathematical Thinking and Reasoning Standards (MTRs). Teachers will also identify possible student misconceptions and tiered instruction.



Performance Indicators

DP.2.1 Provide instruction and experiences that focus on student learning.

Clarification 1: Instruction includes administering and documenting appropriate assessments to inform instruction determined by individual student strengths and needs.

Clarification 2: Instruction includes implementing balanced instructional approaches, based on multiple data points, to support students in the development of Data Analysis and Probability skills.

Clarification 3: Instruction includes implementing evidence-based practices for students with deficiencies, aligned to their strengths and needs to support their mastery in Data Analysis and Probability.

Clarification 4: Refer to the Florida Mathematics Endorsement (K-12) Glossary for assessment types and instructional approaches.

Clarification 5: Refer to Florida's B.E.S.T. Instructional Guide for Mathematics Intervention.

DP.2.2 Integrate the use of applicable manipulatives, technological tools and resources into instruction to support all learners' development of mathematical language and content knowledge within Data Analysis and Probability.

Clarification 1: Manipulatives and tools include, but are not limited to, number lines, tables, diagrams and graphic organizers to aid all learners in their understanding of Data Analysis and Probability.

Clarification 2: Technological tools and resources include, but are not limited to, virtual manipulatives, calculators and mathematics-specific dynamic software.

Clarification 3: Calculators may be used as tools in Grades 6-12 to aid all learners in their understanding of Data Analysis and Probability.

DP.2.3 Plan and provide problem-solving opportunities associated with Data Analysis and Probability, providing feedback to support conceptual understanding and fluency.

Clarification 1: Instruction includes engaging all learners in problem-solving experiences involving data analysis and probability, making use of patterns and structures, applying reading strategies and explaining their reasoning using precise mathematical vocabulary.

Clarification 2: Instruction includes teachers modeling thinking when appropriate and facilitating discussion that presses all learners to justify, compare, and refine solution strategies within data analysis and probability contexts.

DP.2.4 Create a learning environment where students practice using appropriate strategies and methods, employing precise mathematical language, to solve mathematical and real-world problems.

Clarification 1: Instruction includes solving problems involving data analysis and probability using the application of relevant operations.

Clarification 2: Instruction includes representing thinking in multiple ways including, but not limited to, manipulatives, equations, models, tables or diagrams, while explaining connections among representations.

Clarification 3: Instruction includes making connections to prior learning and known strategies, as well as persevering through productive struggle.



Clarification 4: Instruction includes supporting all learners in selecting, revising and refining strategies, and in justifying their thinking and reasoning.

DP.2.5 Demonstrate a conceptual understanding of estimation and reasonableness within teaching Data Analysis and Probability.

Clarification 1: Instruction includes all learners predicting results by estimating quantities using numerical benchmarks and number relationships; and monitoring calculations, procedures and intermediate results during the process of solving problems.

Clarification 2: Instruction includes all learners reflecting on and determining whether answers make sense given the context and revising solutions when results are unreasonable.

Clarification 3: Instruction includes all learners providing explanations and justifications of their thinking and evaluating the thinking of others.

Standard 3 | DP.3: Assessment within Data Analysis and Probability

Teachers demonstrate strategies that support instructional decisions for all learners based on various types of assessments.

Performance Indicators

DP.3.1 Provide knowledge of the five types of assessments.

Clarification 1: The five types of assessments are diagnostic, screening, progress monitoring, formative and summative.

Clarification 2: Instruction includes administering the five types of assessments as appropriate to their purpose and how the data can inform instructional decisions.

DP.3.2 Demonstrate understanding of various assessment tools and how to interpret the data to make instructional decisions for all learners.

Clarification 1: Instruction includes analyzing data to identify trends that indicate progress toward mastery within mathematics standards and benchmarks.

Clarification 2: Instruction includes reviewing assessment results with parents and sharing strategies for supporting mathematical concepts for all learners.

Clarification 3: Instruction includes using assessment and data analysis to monitor student progress and inform instruction over time to ensure an increase in understanding for all learners, including those with identified deficiencies in mathematics.

DP.3.3 Identify through various assessments and multiple data points the distinguishing characteristics of all learners, including those who require enrichment or have a substantial deficiency in mathematics.

Clarification 1: Instruction includes documenting and using multiple data points within a multi-tiered problem-solving process to tailor instruction, tier instruction and intervention, and meet the needs of all learners.



Florida Mathematics Endorsement (K-12) Glossary

The following glossary is a reference list provided for educators to support the expectations of the Florida Mathematics Endorsement (K-12). This glossary is not intended to comprise a comprehensive list. The Florida Department of Education (FDOE) recognizes that there may be alternative definitions for some terms that are also pedagogically or mathematically correct; however, the intention here is to provide a common language and shared understanding among all stakeholders in the state of Florida.

assessments (types): the evaluation of a student's ability to understand or master the mathematical concepts, strategies and skills, covering five types:

- (1) *screening* identifies the probability of risk or success in skills needed for academic achievement. Educators can use screening as an assessment tool designed to collect data for the purpose of measuring the effectiveness of Tier 1, or core, instruction and identifying students who would benefit from additional interventions and support;
- (2) *progress monitoring* is used to determine whether students are learning the skills taught and/or meeting benchmarks throughout the school year. Progress monitoring can be done at the state, district, school and classroom level. Progress monitoring can also be referred to as interim or formative assessments. Educators can use progress monitoring as an ongoing assessment conducted for the purposes of guiding instruction, monitoring student progress, and evaluating instruction and intervention effectiveness;
- (3) *formative* assessments monitor student learning to provide ongoing feedback that can be used by educators to identify the current state of the learners' knowledge and skills. More specifically, educators can use formative assessment on a regular basis to monitor student learning and adjust their current instruction to meet the needs of the learner. Formative assessments provide the opportunity for educators to improve their teaching and for students to improve their learning. Educators can use formative ongoing assessment embedded within teaching to guide instructional decisions and provide indicators for scaffolding, accommodation and/or accessibility solutions;
- (4) *diagnostic* assessments identify a student's strengths and weaknesses for students identified as at-risk on a screening assessment. Educators can use formal or informal diagnostic assessment tools that measure skill strengths and weaknesses, identify skills in need of improvement, and assist in determining why a problem is occurring;
- (5) *summative*, or outcome, assessments are used to evaluate students' performance relative to a set of content standards. Summative assessments can be done at the state, district, school and classroom level and are typically administered near the end of a unit or course to give an overall perspective of the effectiveness of the instruction.

feedback: discussion, comments or suggestions that allow students to learn and grow in their understanding of mathematics, whether from a teacher or peers.

data: points of information (i.e., discussion, formative assessment, summative assessment or classroom observation) collected to gauge student learning of mathematics and drive student-centered instruction.



demonstrate: the act of showing, proving or explaining something clearly through reasoning, evidence or application.

discussion: formal and informal communication (i.e., pictorial, oral or written) that is either teacher-to-student, peer-to-peer or whole group.

engagement: active, authentic participation through discussions and completing the task at hand.

horizontal alignment: the intentional progression of content within a grade level or course, linking skills within and across strands.

instruction informed by assessment: when teachers use assessment data to identify the appropriate instructional approach, select appropriate scaffolds, guide differentiation of instruction and use corrective feedback.

instructional approaches: evidence-based practices designed to improve student outcomes through structured, intentional teaching. The approaches identified by Florida's Formula for Success are explicit, systematic, scaffolded, differentiated, inquiry-based and corrective feedback.

intervention practices: includes evidence-based strategies frequently used to remediate mathematical deficiencies and includes, but is not limited to, individual instruction, multisensory approaches, tutoring, mentoring or the use of technology that targets specific mathematics skills and abilities.

manipulatives: objects or resources, either concrete or virtual simulation, that can be utilized to help students learn mathematics.

misconception: a common misunderstanding or way of thinking that is not correct.

modeling (teaching): when a teacher shows students how to perform a task, strategy or skill step-by-step while describing each step with a rationale.

reasonableness: see MTR.6.1 – Appendix B

solution: an answer to a problem, scenario or task within a lesson, whether during classroom time or outside classroom time.

stages of fluency:

Stage 1 – Exploration: Students explore operations, build understanding, and use manipulatives with no immediate expectation of speed or fluency.

Stage 2 – Procedural reliability: Students can consistently produce accurate results using methods they understand, such as drawings, models or strategies, rather than memorizing procedures.

Stage 3 – Procedural fluency: Students can choose and apply efficient methods accurately and flexibly, often culminating with an automatic recall of mathematical facts.



strand: cumulative content areas that define the essential mathematical skills for K-12 mathematics students. The strands defined in the B.E.S.T. Standards for Mathematics are Number Sense and Operations, Algebraic Reasoning, Fractions, Geometric Reasoning, Measurement, Data Analysis and Probability, Functions, Financial Literacy, Logic and Discrete Theory, and Calculus.

task: an activity or problem (i.e., open-ended problems, multi-step problems, scenarios or a single problem) given to students to complete during classroom time or outside classroom time.

technology tools: digital or physical instruments, applications and platforms that assist students in understanding skills and concepts, performing tasks and solving problems.

tiered instruction: a three-tiered model of intervention and instruction organizes instructional resources on a continuum of increasing intensity. Instruction can be intensified based on student need by increasing time, narrowing the focus to specific barrier skills and/or reducing the size of the group. The three tiers of support are layered to align with each other, focused on progress toward mastery of grade- or course-level benchmarks. The three levels of tiers do not occur as independent silos but rather work together fluidly as one moving unit. Students receive different levels of support at different times.

Universal Design for Learning: an educational, evidence-based framework that guides the development of flexible learning environments and learning spaces that can accommodate individual learning differences.

vertical alignment: the intentional progression of content from one year to the next, spanning across multiple grade levels.



**Appendix A: Situations Involving
Operations with Numbers**



Situations Involving Addition and Subtraction

These situations represent the fundamental meanings and uses of addition and subtraction. The four unshaded situation types are expectations for Kindergarten students. Grade 1 and 2 students should work with all situation types. Darker shading indicates the four most difficult types that students should work with in Grade 1 but need not master until Grade 2.

	Result Unknown	Change Unknown	Start Unknown
Add To	Three birds sat on a wire. Two more birds landed next to them. How many birds are on the wire now? $3 + 2 = ?$	Three birds sat on a wire. Some more birds landed next to them. Then there were five birds on the wire. How many birds landed on the wire next to the first three? $3 + ? = 5$	Some birds were sitting on a wire. Two more birds landed there. Then there were five birds. How many birds were on the wire to start? $? + 2 = 5$
Take From	Five snacks were on the table. Three snacks were eaten. How many snacks are on the table now? $5 - 3 = ?$	Five snacks were on the table. Some snacks were eaten. Then there were two snacks on the table. How many snacks were eaten? $5 - ? = 2$	Some snacks were on the table. Then three snacks were eaten. Now there are two snacks left on the table. How many snacks were on the table at the start? $? - 3 = 2$
	Total Unknown	Addend Unknown	Both Addends Unknown
Put Together	Three purple pens and two red pens were in the box. How many pens are in the box? $3 + 2 = ?$	Five pens are in the box. Three of them are purple, the rest are red. How many pens are red? $3 + ? = 5$ $5 - 3 = ?$	Jennifer has five pens. How many of them could be purple and how many of them could be red? $5 = 0 + 5$ $5 = 5 + 0$ $5 = 1 + 4$ $5 = 4 + 1$ $5 = 2 + 3$ $5 = 3 + 2$
	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare	More: Jim has two pens. Keisha has five pens. How many more pens does Keisha have than Jim? Fewer: Jim has two pens. Keisha has five pens. How many fewer pens does Jim have than Keisha? $2 + ? = 5$ $5 - 2 = ?$	More: Keisha has three more pens than Jim. Jim has two pens. How many pens does Keisha have? Fewer: Jim has three fewer pens than Keisha. Jim has two pens. How many pens does Keisha have? $2 + 3 = ?$ $3 + 2 = ?$	More: Keisha has three more pens than Jim. Keisha has five pens. How many pens does Jim have? Fewer: Jim has three fewer pens than Keisha. Keisha has five pens. How many pens does Jim have? $5 - 3 = ?$ $? + 3 = 5$

Adapted from Box 2-4 of *Mathematics Learning in Early Childhood*, National Research Council (2009, pp. 32-33).



Situations Involving Multiplication and Division

These situations represent the fundamental meanings and uses of multiplication and division. The situations increase in difficulty when moving from the top of the page to the bottom and from left to right across the page. Students in Grade 3 should work with all situation types but need not master the multiplicative comparisons until Grade 4.

	Unknown Product	Group Size Unknown (Partitive or Fair Shares Division)	Number of Groups Unknown (Quotative or Measurement Division)
	$3 \times 6 = ?$	$3 \times ? = 18$ $18 \div 3 = ?$	$? \times 6 = 18$ $18 \div 6 = ?$
Equal Groups	There are 3 bags with 6 plums in each bag. How many plums are there in all?	If 18 plums are shared equally into 3 bags, then how many plums will be in each bag?	If 18 plums are to be packed 6 to a bag, then how many bags are needed?
Arrays	There are 3 rows of apples with 6 apples in each row. How many apples are there?	If 18 apples are arranged into 3 equal rows, how many apples will be in each row?	If 18 apples are arranged into equal rows of 6 apples, how many rows will there be?
Multiplicative Comparisons	A blue hat costs \$6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost?	A red hat costs \$18 and that is 3 times as much as a blue hat costs. How much does the blue hat cost?	A red hat costs \$18 and a blue hat costs \$6. How many times as much does the red hat cost as the blue hat?

Adapted from Box 2-4 of *Mathematics Learning in Early Childhood*, National Research Council (2009, pp. 32-33).



Appendix B: Mathematical Thinking and Reasoning Standards



Florida K-12 Mathematical Thinking and Reasoning Standards

MTR: *Because Math Matters*

Florida students are expected to engage with mathematics through the Mathematical Thinking and Reasoning (MTR) Standards. These standards are written in clear language so all stakeholders can understand them and students can use them as self-monitoring tools. The MTR Standards promote deeper learning and understanding of mathematics. The clarifications are included to guide teachers in the integration of the MTR Standards within mathematics instruction.

MA.K12.MTR.1.1 Actively participate in effortful learning both individually and collectively.

Mathematicians who participate in effortful learning both individually and with others:

- Analyze the problem in a way that makes sense given the task.
- Ask questions that will help with solving the task.
- Build perseverance by modifying methods as needed while solving a challenging task.
- Stay engaged and maintain a positive mindset when working to solve tasks.
- Help and support each other when attempting a new method or approach.

Clarifications:

Teachers who encourage students to participate actively in effortful learning both individually and with others:

- Cultivate a community of growth mindset learners.
- Foster perseverance in students by choosing tasks that are challenging.
- Develop students' ability to analyze and problem solve.
- Recognize students' effort when solving challenging problems.

MA.K12.MTR.2.1 Demonstrate understanding by representing problems in multiple ways.

Mathematicians who demonstrate understanding by representing problems in multiple ways:

- Build understanding through modeling and using manipulatives.
- Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations.
- Progress from modeling problems with objects and drawings to using algorithms and equations.
- Express connections between concepts and representations.
- Choose a representation based on the given context or purpose.

Clarifications:

Teachers who encourage students to demonstrate understanding by representing problems in multiple ways:

- Help students make connections between concepts and representations.
- Provide opportunities for students to use manipulatives when investigating concepts.
- Guide students from concrete to pictorial to abstract representations as understanding progresses.
- Show students that various representations can have different purposes and can be useful in different situations.

**MA.K12.MTR.3.1 Complete tasks with mathematical fluency.**

Mathematicians who complete tasks with mathematical fluency:

- Select efficient and appropriate methods for solving problems within the given context.
- Maintain flexibility and accuracy while performing procedures and mental calculations.
- Complete tasks accurately and with confidence.
- Adapt procedures to apply them to a new context.
- Use feedback to improve efficiency when performing calculations.

Clarifications:

Teachers who encourage students to complete tasks with mathematical fluency:

- Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately.
- Offer multiple opportunities for students to practice efficient and generalizable methods.
- Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.

MA.K12.MTR.4.1 Engage in discussions that reflect on the mathematical thinking of self and others.

Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:

- Communicate mathematical ideas, vocabulary and methods effectively.
- Analyze the mathematical thinking of others.
- Compare the efficiency of a method to those expressed by others.
- Recognize errors and suggest how to correctly solve the task.
- Justify results by explaining methods and processes.
- Construct possible arguments based on evidence.

Clarifications:

Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others:

- Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.
- Create opportunities for students to discuss their thinking with peers.
- Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods.
- Develop students' ability to justify methods and compare their responses to the responses of their peers.

**MA.K12.MTR.5.1 Use patterns and structure to help understand and connect mathematical concepts.**

Mathematicians who use patterns and structure to help understand and connect mathematical concepts:

- Focus on relevant details within a problem.
- Create plans and procedures to logically order events, steps or ideas to solve problems.
- Decompose a complex problem into manageable parts.
- Relate previously learned concepts to new concepts.
- Look for similarities among problems.
- Connect solutions of problems to more complicated, large-scale situations.

Clarifications:

Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts:

- Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts.
- Support students to develop generalizations based on the similarities found among problems.
- Provide opportunities for students to create plans and procedures to solve problems.
- Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

MA.K12.MTR.6.1 Assess the reasonableness of solutions.

Mathematicians who assess the reasonableness of solutions:

- Estimate to discover possible solutions.
- Use benchmark quantities to determine if a solution makes sense.
- Check calculations when solving problems.
- Verify possible solutions by explaining the methods used.
- Evaluate results based on the given context.

Clarifications:

Teachers who encourage students to assess the reasonableness of solutions:

- Have students estimate or predict solutions prior to solving.
- Prompt students to continually ask, "Does this solution make sense? How do you know?"
- Reinforce that students check their work as they progress within and after a task.
- Strengthen students' ability to verify solutions through justifications.

**MA.K12.MTR.7.1 Apply mathematics to real-world contexts.**

Mathematicians who apply mathematics to real-world contexts:

- Connect mathematical concepts to everyday experiences.
- Use models and methods to understand, represent and solve problems.
- Perform investigations to gather data or determine if a method is appropriate.
- Redesign models and methods to improve accuracy or efficiency.

Clarifications:

Teachers who encourage students to apply mathematics to real-world contexts:

- Provide opportunities for students to create models, both concrete and abstract, and perform investigations.
- Challenge students to question the accuracy of their models and methods.
- Support students as they validate conclusions by comparing them to the given situation.
- Indicate how various concepts can be applied to other disciplines.

DRAFT