Algebraic Reasoning

Grades 3, 4, and 5

Grade Level Expectations for the Sunshine State Standards

MATH – Third Grade

**Strand A: Number Sense, Concepts, and Operations**

Standard 3: The student understands the effects of operations on numbers and the relationship among these operations, selects appropriate operations, and computes for problem solving.

**Benchmarks**
- MA.A. 3.2.1a Shows the inverse relationship between multiplication and division by building models, drawing diagrams, and acting out problem situations.
- MA.A. 3.2.2 Writes number sentences associated with addition, subtraction, multiplication, and division by building models, drawing diagrams, and acting out problem situations.
- MA.A. 3.2.3 Adds, subtracts, and multiplies whole numbers using a variety of techniques, including mental arithmetic, paper and pencil, and a calculator.

**Strand B: Measurement**

Standard 2: The student compares, contrasts, and converts within systems of measurement.

**Benchmark**
- MA.B. 2.2.2 Selects and uses standard and non-standard units and instruments to measure real objects.

Standard 3: The student estimates measurements in real-world problem situations.

**Benchmark**
- MA.B.3.2.1a Estimates length, weight, capacity/volume, and temperature in whole standard units and uses appropriate instruments to verify the estimate.

Standard 4: The student selects and uses appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.

**Benchmarks**
- MA.B. 4.2.1 Determines which units of measurement to use with answers to real-world problems.
- MA.B. 4.2.2 Selects and uses appropriate tools to measure length, weight, capacity/volume, and temperature.

**Strand C: Geometry and Spatial Sense**

Standard 1: The student describes, draws, identifies, and analyzes two- and three-dimensional shapes.

**Benchmarks**
- MA.C. 1.2.1a Recognizes and names two- and three-dimensional figures in various orientations.
- MA.C. 1.2.1b Draws common two-dimensional figures.

**Strand D: Algebraic Thinking**

Standard 1: The student describes, analyzes, and generalizes a wide variety of patterns, relations, and functions.

**Benchmark**
- MA.D. 1.2.1 Describes number and geometric patterns through models such as manipulatives, tables or graphs, and by stating a rule that describes the underlying numeric or geometric relationship.

Standard 2: The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.
(Algebraic Reasoning – 3rd grade math – continued)

**Benchmarks**

MA.D. 2.2.1  Writes an equation or expression using variables or a geometric symbol that correspond to a given real-world problem.

MA.D. 2.2.2  Uses physical objects and numerical situations to show the meaning of equality and inequality and uses the appropriate symbolisms.

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**Strand E: Data Analysis and Probability**

Standard 1: The student understands and uses the tools of data analysis for managing information.

**Benchmark**

MA.E. 1.2.3  Describes conclusions drawn from data, graphs, or plots.

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**MATH – Fourth Grade**

**Strand A: Number Sense, Concepts, and Operations**

Standard 3: The student understands the effects of operations on numbers and the relationship among these operations, selects appropriate operations, and computes for problem solving.

**Benchmarks**

MA.A. 3.2.1  Understands and explains the effects of addition, subtraction, multiplication, division on whole numbers including the inverse relationship of multiplication and division.

MA.A. 3.2.2  Writes number sentences involving combinations of operations from specific problem situations.

MA.A. 3.2.3  Adds and subtracts whole numbers and decimals to hundredths, multiplies and divides whole numbers to solve real-world problems using a variety of techniques, including mental arithmetic, paper and pencil, and a calculator.

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**Strand B: Measurement**

Standard 1: The student measures quantities in the real world and uses the measures to solve problems.

**Benchmark**

MA.B. 1.2.2  Determines perimeter, area, and capacity/volume using manipulatives and diagrams to solve real-world problems.

Standard 2: The student compares, contrasts, and converts within systems of measurement.

**Benchmark**

MA.B. 2.2.2  Selects and uses standard units appropriate for a particular situation.

Standard 4: The student selects and uses appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.

**Benchmark**

MA.B. 4.2.1  Determines which units of measurement to use with answers to real-world problems.

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**Strand C: Geometry and Spatial Sense**

Standard 1: The student describes, draws, identifies, and analyzes two- and three-dimensional shapes.

**Benchmark**

MA.C. 1.2.1b  Draws common two-dimensional geometric figures with specified measurements.

Standard 3: The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.

**Benchmark**

MA.C. 3.2.1  Applies a variety of strategies and geometric properties/formulas for two- and three-dimensional shapes to solve real-world problems.

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**Strand D: Algebraic Thinking**

Standard 1: The student describes, analyzes, and generalizes a wide variety of patterns, relations, and functions.
(Algebraic Thinking – 4th grade math – continued)

**Benchmarks**

MA.D. 1.2.1  Describes number and geometric patterns through models such as manipulatives, tables or graphs, and by stating a rule that describes the underlying numeric or geometric relationship.

MA.D. 1.2.2  Explains the effects of a change in one quantity on a pattern, relation, or function.

**Standard 2:** The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

**Benchmarks**

MA.D. 2.2.1  Translates verbal phrases into mathematical expressions that include a variable and conversely translates a mathematical expression that includes a variable into a verbal phrase.

MA.D. 2.2.2  Uses physical models and graphs to solve real-world problems involving equations.

**Strand E: Data Analysis and Probability**

**Standard 1:** The student understands and uses the tools of data analysis for managing information.

**Benchmarks**

MA.E. 1.2.1  Communicates mathematical ideas and real-world data through appropriate graphs, including histograms, bar graphs, circle graphs, line graphs, pictographs, and charts.

**MATH – Fifth Grade**

**Strand A: Number Sense, Concepts, and Operations**

**Standard 1:** The student understands the different ways numbers are represented and used in the real world.

**Benchmark**

MA.A. 1.2.3  Understands concrete and symbolic representations of whole numbers, fractions, decimals, and percents in real-world situations.

**Standard 3:** The student understands the effects of operations on numbers and the relationship among these operations, selects appropriate operations, and computes for problem solving.

**Benchmarks**

MA.A. 3.2.1  Understands and explains the effects of addition, subtraction, and multiplication on whole numbers, decimals, and fractions, including mixed numbers, and the effects of division on whole numbers, including the inverse relationship of multiplication and division.

MA.A. 3.2.2  Selects the appropriate operation to solve specific problems involving addition, subtraction, and multiplication of whole numbers, decimals, and fractions, and division of whole numbers.

MA.A. 3.2.3  Adds and subtracts, and multiplies whole numbers, decimals, and fractions, including mixed numbers, and divides whole numbers to solve real-world problems using a variety of techniques, including mental arithmetic, paper and pencil, and a calculator.

**Strand B: Measurement**

**Standard 1:** The student measures quantities in the real world and uses the measures to solve problems.

**Benchmarks**

MA.B. 1.2.1  Uses concrete and graphic models to develop procedures for solving problems related to measurement.

MA.B. 1.2.2  Solves real-world problems involving length, weight, perimeter, area, capacity, volume, time, temperature, and angles.

**Standard 4:** The student selects and uses appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.

**Benchmark**

MA.B. 4.2.2  Selects and uses appropriate instruments and technology to measure in real-world situations.

**Strand C: Geometry and Spatial Sense**

**Standard 1:** The student describes, draws, identifies, and analyzes two- and three-dimensional shapes.
Benchmark
MA.C. 1.2.1  Draws common two-dimensional geometric figures with specified measurements.

Standard 3: The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.

Benchmark
MA.C. 3.2.1  Applies a variety of strategies and geometric properties/formulas for two- and three-dimensional shapes to solve real-world problems.

**Strand D: Algebraic Thinking**

Standard 1: The student describes, analyzes, and generalizes a wide variety of patterns, relations, and functions.

Benchmarks
MA.D. 1.2.1  Describes number and geometric patterns through models such as manipulatives, tables or graphs, using algebraic symbols.
MA.D. 1.2.2  Generalizes a pattern, relation, or function to explain how a change in one quantity results in a change in another.

Standard 2: The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

Benchmarks
MA.D. 2.2.1  Represents a given simple problem situation using diagrams, models, and symbolic expressions translated from verbal phrases, or verbal phrases translated from symbolic expressions.
MA.D. 2.2.2  Uses physical models and graphs to solve real-world problems involving equations.

**Strand E: Data Analysis and Probability**

Standard 1: The student understands and uses the tools of data analysis for managing information.

Benchmark
MA.E. 1.2.1  Communicates mathematical ideas and real-world data through appropriate graphs, including histograms, bar graphs, circle graphs, line graphs, pictographs, and charts.

**LANGUAGE ARTS – Third, Fourth, and Fifth Grades**

**Strand B: Writing**

Standard 2: The student writes to communicate ideas and information effectively.

Benchmark
LA.B. 2.2.3  Writes for a variety of occasions, audiences, and purposes.

**Strand C: Listening, Viewing, Speaking**

Standard 1: The student uses listening strategies effectively.

Benchmarks  (3rd and 4th only)
LA.C. 1.2.3  Interacts with others in a variety of situations to develop and present familiar ideas.
LA.C. 1.2.5  Responds to speakers by asking questions, making contributions, evaluating and paraphrasing what is said.

Standard 3: The student uses speaking strategies effectively.

Benchmark  (3rd and 4th only)
LA.C. 3.2.2  Asks questions and makes comments and observations to clarify understanding of content, process, and experiences.

Benchmark
LA.C. 3.2.3  Speaks for specific occasions, audiences, and purposes, including conversations, discussions, projects, and informational or imaginative presentations.

Benchmark  (3rd and 4th only)
LA.C. 3.2.5  Participates as a contributor and occasionally acts as a leader in a group discussion.