

Understanding the Content Standards

Clicking on each of the standards below will provide a brief description of the standard along with a breakdown of the standard through its learning objectives. For more detailed information about how to help students build toward mastery of these standards and background information, review *Explanation of the Mathematics Content Standards*.

Grade 3 Mathematics	
Mathematical Practice <u>3.MP</u>	
Numerical Reasoning <u>3.NR.1</u> <u>3.NR.4</u>	Patterning & Algebraic Reasoning <u>3.PAR.2</u> <u>3.PAR.3</u>
Measurement & Data Reasoning <u>3.MDR.5</u>	Geometric & Spatial Reasoning <u>3.GSR.6</u> <u>3.GSR.7</u> <u>3.GSR.8</u>

Understanding the Content Standards

MATHEMATICAL PRACTICES STANDARD/KEY COMPETENCY
MATHEMATICAL PRACTICES – <i>reasoning and explaining, modeling and using tools, seeing structure and generalizing</i>
3.MP: Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.
<p>Understanding the Intent and Rigor of the Standard</p> <p><i>This standard consists of a breakdown through several learning objectives. These learning objectives are not meant to be taught in isolation, but rather in clusters of related learning objectives. The Grade 3 curriculum map provides suggestions for clustering learning objectives within each unit.</i></p> <p>The Mathematical Practices describe the reasoning behaviors students should develop as they build an understanding of mathematics – the “habits of mind” that help students become mathematical thinkers. There are eight standards, which apply to all grade levels and conceptual categories.</p> <p>These mathematical practices describe how students should engage with the mathematics content for their grade level. Developing these habits of mind builds students’ capacity to become mathematical thinkers. These practices can be applied individually or together in mathematics lessons, and no particular order is required. In well-designed lessons, there are often two or more Mathematical Practices present.</p>
Breakdown of Standard/Key Competency (Expectation/Learning Objective)
3.MP.1 Make sense of problems and persevere in solving them.
3.MP.2 Reason abstractly and quantitatively.
3.MP.3 Construct viable arguments and critique the reasoning of others.
3.MP.4 Model with mathematics.
3.MP.5 Use appropriate tools strategically.
3.MP.6 Attend to precision.
3.MP.7 Look for and make use of structure.
3.MP.8 Look for and express regularity in repeated reasoning.

STANDARD/KEY COMPETENCY 1

NUMERICAL REASONING – base ten numerals and place value up to 10,000, and rounding up to 1,000

3.NR.1: Use place value reasoning to represent, read, write, and compare numerical values up to 10,000 and round whole numbers up to 1,000.

Understanding the Intent and Rigor of the Standard

This standard consists of a breakdown through several learning objectives. These learning objectives are not meant to be taught in isolation, but rather in clusters of related learning objectives. The Grade 3 curriculum map provides suggestions for clustering learning objectives within each unit.

When learning this standard, students build on their knowledge of patterns in the base ten place value system and rounding learned in second grade. Students read and write multi-digit numbers to 10,000 using base ten numerals and expanded form. In addition, students use place value reasoning to compare numbers up to 10,000. This means that students use the values of the digits to make sense of the values of the numbers being compared. Making sense of the values of the digits that make a number builds understanding and helps students see the relevance of place value. Students also use place value reasoning to build an understanding of rounding, what it means to round numbers, and when rounding numbers makes sense.

Breakdown of Standard/Key Competency 1 (Expectation/Learning Objective)

3.NR.1.1 Read and write multi-digit whole numbers up to 10,000 using base-ten numerals and expanded form.

3.NR.1.2 Use place value reasoning to compare multi-digit numbers up to 10,000, using $>$, $=$, and $<$ symbols to record the results of comparisons.

3.NR.1.3 Use place value understanding to round whole numbers up to 1000 to the nearest 10 or 100.

STANDARD/KEY COMPETENCY 2

PATTERNING & ALGEBRAIC REASONING – fluency, addition and subtraction within 10,000, multiplication and division within 100, equality, properties of operations

3.PAR.2: Use part-whole strategies to represent and solve real-life problems involving addition and subtraction with whole numbers within 10,000.

Understanding the Intent and Rigor of the Standard

This standard consists of a breakdown through several learning objectives. These learning objectives are not meant to be taught in isolation, but rather in clusters of related learning objectives. The Grade 3 curriculum map provides suggestions for clustering learning objectives within each unit.

When learning this standard, students build toward fluency with addition and subtraction within 1000. To do this, students work with all problem types and use a variety of strategies based on place value, part-whole, and properties of operations. Multiple strategies enable students to develop fluency and transfer that understanding to related computation problems. Students also apply part-whole strategies to solve problems involving addition and subtraction within 10,000. The focus of this standard is on addition and subtraction through mathematical reasoning and sense-making.

Breakdown of Standard/Key Competency 2 (Expectation/Learning Objective)

3.PAR.2.1 Fluently add and subtract within 1000 to solve problems.

3.PAR.2.2 Apply part-whole strategies, properties of operations and place value understanding, to solve problems involving addition and subtraction within 10,000. Represent these problems using equations with a letter standing for the unknown quantity. Justify solutions.

STANDARD/KEY COMPETENCY 3

PATTERNING & ALGEBRAIC REASONING – fluency, addition and subtraction within 10,000, multiplication and division within 100, equality, properties of operations

3.PAR.3: Use part-whole strategies to solve real-life, mathematical problems involving multiplication and division with whole numbers within 100.

Understanding the Intent and Rigor of the Standard

This standard consists of a breakdown through several learning objectives. These learning objectives are not meant to be taught in isolation, but rather in clusters of related learning objectives. The Grade 3 curriculum map provides suggestions for clustering learning objectives within each unit.

When learning this standard, students generate, extend, and create numeric patterns related to multiplication. As students engage in this work, they make predictions, describe how patterns are growing, and begin to further develop the ability to reason algebraically. Students also, represent multiplication and division facts using groups, arrays, number lines, and area models to build a deeper understanding of these ideas and their connections to each other. This work extends to applications of the commutative, associative, and distributive properties to multiply and divide within 100. In addition, students build upon their prior knowledge of equality to use relational understanding to determine whether expressions involving addition, subtraction, and multiplication are equivalent. Multiplication ideas are further developed as students use place value reasoning to multiply one-digit whole numbers by multiples of 10 and extended further to multiply and divide within 100 using part-whole reasoning visual representations and/or concrete models. This is where the distributive property may become especially useful. All of these ideas are embedded within real-life mathematical problems involving multiplication and division. Students should represent these problems with equations with a letter (variable) standing for the unknown quantity.

Breakdown of Standard/Key Competency 3 (Expectation/Learning Objective)

3.PAR.3.1 Describe, extend, and create numeric patterns related to multiplication. Make predictions related to the patterns.

3.PAR.3.2 Represent single digit multiplication and division facts using a variety of strategies. Explain the relationship between multiplication and division.

3.PAR.3.3 Apply properties of operations (i.e., commutative property, associative property, distributive property) to multiply and divide within 100.

3.PAR.3.4 Use the meaning of the equal sign to determine whether expressions involving addition, subtraction, and multiplication are equivalent.

3.PAR.3.5 Use place value reasoning and properties of operations to multiply one-digit whole numbers by multiples of 10, in the range 10-90.

3.PAR.3.6 Solve practical, relevant problems involving multiplication and division within 100 using part-whole strategies, visual representations, and/or concrete models.

3.PAR.3.7 Use multiplication and division to solve problems involving whole numbers to 100. Represent these problems using equations with a letter standing for the unknown quantity. Justify solutions.

STANDARD/KEY COMPETENCY 4

NUMERICAL REASONING – unit fractions, equivalent fractions, fractions greater than 1

3.NR.4: Represent fractions with denominators of 2, 3, 4, 6 and 8 in multiple ways within a framework using visual models.

Understanding the Intent and Rigor of the Standard

This standard consists of a breakdown through several learning objectives. These learning objectives are not meant to be taught in isolation, but rather in clusters of related learning objectives. The Grade 3 curriculum map provides suggestions for clustering learning objectives within each unit.

When learning this standard, students use visual fraction models to make sense of fractions. These may include area models, number lines or collection/set models. Students are just beginning to use fraction notation as a way to refer to a part of a whole. This new notation can be confusing, so looking at multiple visual representations and providing feedback to students as they make sense of these new numbers can be very beneficial. Students also compare two unit fractions with visual fraction models and develop strategies for these comparisons. Fractions greater than one are also introduced and students should be provided multiple opportunities to investigate these fractions along with fractions less than one. Students also generate simple equivalent fractions using the denominators listed above. The goal here, is to make sense of equivalent fractions using visual representations.

Breakdown of Standard/Key Competency 4 (Expectation/Learning Objective)

3.NR.4.1 Describe a unit fraction and explain how multiple copies of a unit fraction form a non-unit fraction. Use parts of a whole, parts of a set, points on a number line, distances on a number line and area models.

3.NR.4.2 Compare two unit fractions by flexibly using a variety of tools and strategies.

3.NR.4.3 Represent fractions, including fractions greater than one, in multiple ways.

3.NR.4.4 Recognize and generate simple equivalent fractions.

STANDARD/KEY COMPETENCY 5

MEASUREMENT & DATA REASONING – elapsed time, liquid volume, mass, lengths in half and fourth of an inch, data

3.MDR.5: Solve real-life, mathematical problems involving length, liquid volume, mass, and time.

Understanding the Intent and Rigor of the Standard

This standard consists of a breakdown through several learning objectives. These learning objectives are not meant to be taught in isolation, but rather in clusters of related learning objectives. The Grade 3 curriculum map provides suggestions for clustering learning objectives within each unit.

When learning this standard, students tell and write time to the nearest minute and estimate time to the nearest 15 minutes. This extends the work done in previous grades regarding telling time. Students' work with elapsed time also continues to develop as they solve meaningful problems including intervals of time to the hour, half-hour, and quarter-hour. Students also build on their understandings of measurement to measure lengths to the nearest inch, half-inch, and quarter-inch. The measurement of liquid volumes, lengths, and masses of objects are introduced and students solve problems involving these units as they reason about the relative sizes of units in the customary measurement system. Students will also learn to ask statistical questions, and collect, display and analyze data to answer these questions.

Note: In third grade, the focus should be on customary units for measurement and data. However, metric measurement units can be used with data as a preview of further study of these units in 4th grade. These metric units will not be assessed.

Breakdown of Standard/Key Competency 5 (Expectation/Learning Objective)

3.MDR.5.1 Ask questions and answer them based on gathered information, observations, and appropriate graphical displays to solve problems relevant to everyday life.

3.MDR.5.2 Tell and write time to the nearest minute and estimate time to the nearest fifteen minutes (quarter hour) from the analysis of an analog clock.

3.MDR.5.3 Solve meaningful problems involving elapsed time, including intervals of time to the hour, half hour, and quarter hour where the times presented are only on the hour, half hour, or quarter hour within a.m. or p.m. only.

3.MDR.5.4 Use rulers to measure lengths in halves and fourths (quarters) of an inch and a whole inch.

3.MDR.5.5 Estimate and measure liquid volumes, lengths and masses of objects using customary units. Solve problems involving mass, length, and volume given in the same unit, and reason about the relative sizes of measurement units within the customary system.

STANDARD/KEY COMPETENCY 6

GEOMETRIC & SPATIAL REASONING – polygons, parallel line segments, perpendicular line segments, right angles, lines of symmetry, area, perimeter

3.GSR.6: Identify the attributes of polygons, including parallel segments, perpendicular segments, right angles, and symmetry.

Understanding the Intent and Rigor of the Standard

This standard consists of a breakdown through several learning objectives. These learning objectives are not meant to be taught in isolation, but rather in clusters of related learning objectives. The Grade 3 curriculum map provides suggestions for clustering learning objectives within each unit.

When learning this standard, students identify perpendicular and parallel line segments in polygons. Students also classify, compare, and contrast polygons, with a focus on quadrilaterals, based on properties. In addition, students build on their work with symmetry in second grade to identify lines of symmetry in polygons.

Breakdown of Standard/Key Competency 6 (Expectation/Learning Objective)

3.GSR.6.1 Identify perpendicular line segments, parallel line segments, and right angles, identify these in polygons, and solve problems involving parallel line segments, perpendicular line segments, and right angles.

3.GSR.6.2 Classify, compare, and contrast polygons, with a focus on quadrilaterals, based on properties. Analyze specific 3- dimensional figures to identify and describe quadrilaterals as faces of these figures.

3.GSR.6.3 Identify lines of symmetry in polygons.

STANDARD/KEY COMPETENCY 7

GEOMETRIC & SPATIAL REASONING – polygons, parallel line segments, perpendicular line segments, right angles, lines of symmetry, area, perimeter

3.GSR.7: Identify area as a measurable attribute of rectangles and determine the area of a rectangle presented in real-life, mathematical problems.

Understanding the Intent and Rigor of the Standard

This standard consists of a breakdown through several learning objectives. These learning objectives are not meant to be taught in isolation, but rather in clusters of related learning objectives. The Grade 3 curriculum map provides suggestions for clustering learning objectives within each unit.

When learning this standard, students build an understanding of area as a measurable attribute of quadrilaterals. They begin by covering rectangular spaces with multiple copies of the same unit with no gaps or overlaps to determine the total area. Students determine the area of rectangular shapes in real-life problems by tiling and counting, then make the connection to multiplication and arrays studied earlier in the year. A really nice connection comes from previous work with the distributive property of multiplication over addition that can be applied to solve area problems as well.

Breakdown of Standard/Key Competency 7 (Expectation/Learning Objective)

3.GSR.7.1 Investigate area by covering the space of rectangles presented in realistic situations using multiple copies of the same unit, with no gaps or overlaps, and determine the total area (total number of units that covered the space).

3.GSR.7.2 Determine the area of rectangles (or shapes composed of rectangles) presented in relevant problems by tiling and counting.

3.GSR.7.3 Discover and explain how area can be found by multiplying the dimensions of a rectangle.

STANDARD/KEY COMPETENCY 8

GEOMETRIC & SPATIAL REASONING – polygons, parallel line segments, perpendicular line segments, right angles, lines of symmetry, area, perimeter

3.GSR.8: Determine the perimeter of a polygon presented in real-life, mathematical problems.

Understanding the Intent and Rigor of the Standard

This standard consists of a breakdown through several learning objectives. These learning objectives are not meant to be taught in isolation, but rather in clusters of related learning objectives. The Grade 3 curriculum map provides suggestions for clustering learning objectives within each unit.

When learning this standard, students determine the perimeter of polygons and explain that the perimeter is the distance around a polygon. Students should explore perimeters of polygons up to ten sides, but there should be a focus on quadrilaterals. Students should find perimeters of objects given the side lengths and find unknown side lengths given the perimeter. All problems should be real-life, mathematical problems. In addition, students should investigate the connection between area and perimeter by exploring what happens when the area stays the same but the perimeter changes and what happens when the perimeter stays the same and the area changes.

Breakdown of Standard/Key Competency 8 (Expectation/Learning Objective)

3.GSR.8.1 Determine the perimeter of a polygon and explain that the perimeter represents the distance around a polygon. Solve problems involving perimeters of polygons.

3.GSR.8.2 Investigate and describe how rectangles with the same perimeter can have different areas or how rectangles with the same area can have different perimeters.