

# Core Content for Assessment: Number Properties and Operations

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End of Primary	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade	11th Grade
<b>Number Sense</b>						
<p><b>MA-EP-1.1.1</b> Students will:</p> <ul style="list-style-type: none"> <li>Apply multiple representations (e.g., drawings, manipulatives, base-10 blocks, number lines, expanded form, symbols) to describe whole numbers (0 to 999);</li> <li>Apply multiple representations (e.g., drawings, manipulatives, base-10 blocks, number lines, expanded form, symbols) to describe fractions (halves, thirds, fourths);</li> <li>Apply these numbers to represent real-world problems; and</li> <li>Explain how the base 10 number system relates to place value.</li> </ul>	<p><b>MA-04-1.1.1</b> Students will:</p> <ul style="list-style-type: none"> <li>Apply multiple representations (e.g., drawings, manipulatives, base-10 blocks, number lines, expanded form, symbols) to represent whole numbers (0 to 99,999);</li> <li>Apply multiple representations (e.g., drawings, manipulatives, base-10 blocks, number lines, expanded form, symbols) to describe commonly used fractions through tenths and decimals through hundredths;</li> <li>Apply these numbers to represent real-world problems; and</li> <li>Explain how the base 10 number system relates to place value.</li> </ul>	<p><b>MA-05-1.1.1</b> Students will:</p> <ul style="list-style-type: none"> <li>Apply multiple representations (e.g., drawings, manipulatives, base-10 blocks, number lines, expanded form, symbols) to represent whole numbers (0 to 99,999,999);</li> <li>Apply multiple representations (e.g., drawings, manipulatives, base-10 blocks, number lines, expanded form, symbols) to describe commonly-used fractions, mixed numbers, and decimals through thousandths;</li> <li>Apply these numbers to represent real-world problems; and</li> <li>Explain how the base-10 number system relates to place value.</li> </ul>	<p><b>MA-06-1.1.1</b> Students will provide examples of and describe fractions, decimals, and percents.</p>	<p><b>MA-07-1.1.1</b> Students will provide examples of and describe integers, fractions, decimals, percents, and <math>\pi</math>.</p>	<p><b>MA-08-1.1.1</b> Students will provide examples of and describe rational numbers and irrational numbers (square roots and <math>\pi</math> only).</p>	
<p><b>MA-EP-1.1.2</b> Students will compare (<math>&lt;</math>, <math>&gt;</math>, <math>=</math>) whole numbers and fractions (limited to pictorially), and explain how fractions, decimals (as money only) and whole numbers relate (equivalence, order).</p>	<p><b>MA-04-1.1.2</b> Students will compare (<math>&lt;</math>, <math>&gt;</math>, <math>=</math>) whole numbers, commonly used fractions through tenths, and decimals through hundredths, and explain how commonly used fractions, decimals, and whole numbers relate (equivalence, order).</p>	<p><b>MA-05-1.1.2</b> Students will compare (<math>&lt;</math>, <math>&gt;</math>, <math>=</math>) whole numbers (0 to 99,999,999), fractions, and decimals (through thousandths), and explain how commonly-used fractions, decimals, and whole numbers relate (equivalence, order).</p>	<p><b>MA-06-1.1.2</b> Students will convert between any two of the following numbers: fractions, decimals, and percents (less than or equal to 100%); and will compare these numbers.</p>	<p><b>MA-07-1.1.2</b> Student will convert among whole numbers, fractions, decimals, percents, and <math>\pi</math>, and will compare these numbers.</p>	<p><b>MA-08-1.1.2</b> Students will compare multiple numerical representations (e.g., fractions, decimals, percentages) of rational numbers and irrational numbers (square roots and <math>\pi</math> only).</p>	
<b>Estimation</b>						
<p><b>MA-EP-1.2.1</b> Students will apply and describe appropriate strategies for estimating quantities of objects and computational results (limited to addition and subtraction).</p>	<p><b>MA-04-1.2.1</b> Students will apply and describe appropriate strategies for estimating quantities of objects and computational results.</p>	<p><b>MA-05-1.2.1</b> Students will apply and describe appropriate strategies for estimating quantities of objects and computational results in real-world situations.</p>	<p><b>MA-06-1.2.1</b> Students will estimate to solve real-world and/or mathematical problems with whole numbers, fractions, decimals, and percents, checking for reasonable and appropriate computational results.</p>	<p><b>MA-07-1.2.1</b> Students will estimate to solve real-world and/or mathematical problems with fractions, decimals, and percents, checking for reasonable and appropriate computational results.</p>	<p><b>MA-08-1.2.1</b> Students will estimate to solve real-world and/or mathematical problems with rational numbers, checking for reasonable and appropriate computational results.</p>	
<b>Number Operations</b>						
<p><b>MA-EP-1.3.1</b> Students will analyze real-world situations to identify the appropriate mathematical operations, and will apply operations to solve real-world problems with the following constraints:</p> <ul style="list-style-type: none"> <li>Add and subtract whole numbers with three digits or less;</li> <li>Multiply whole numbers of 10 or less;</li> <li>Add and subtract fractions with like denominators less than four; and</li> <li>Add and subtract decimals related to money.</li> </ul>	<p><b>MA-04-1.3.1</b> Students will analyze real-world situations to identify the appropriate mathematical operations, and will apply operations to solve real-world problems with the following constraints:</p> <ul style="list-style-type: none"> <li>Add and subtract whole numbers with four digits or less;</li> <li>Multiply whole numbers with two digits or less;</li> <li>Divide whole numbers with three digits or less by single-digit divisors (with or without remainders);</li> <li>Add and subtract fractions with like denominators less than 10; and</li> <li>Add and subtract decimals through hundredths.</li> </ul>	<p><b>MA-05-1.3.1</b> Students will analyze real-world situations to identify the appropriate mathematical operations, and will apply operations to solve real-world problems with the following constraints:</p> <ul style="list-style-type: none"> <li>Add, subtract, multiply, and divide whole numbers (less than 100,000,000);</li> <li>Add and subtract fractions with like denominators through 16; with sums less than or equal to one; and</li> <li>Add and subtract decimals through hundredths.</li> </ul>	<p><b>MA-06-1.3.1</b> Students will add, subtract, multiply, divide, and apply order of operations with whole numbers, fractions, and decimals to solve real-world problems.</p>	<p><b>MA-07-1.3.1</b> Students will add, subtract, multiply, divide, and apply order of operations (including positive whole number exponents) with whole numbers, fractions, and decimals to solve real-world problems.</p>	<p><b>MA-08-1.3.1</b> Students will add, subtract, multiply, divide, and apply order of operations (including positive whole number exponents) with rational numbers to solve real-world problems.</p>	<p><b>MA-H11-1.3.1</b> Students will solve real-world problems to specified accuracy levels by simplifying real number expressions involving addition, subtraction, multiplication, division, absolute value, integer exponents, roots (square, cube), and factorials.</p>
						<p><b>MA-H11-1.3.2</b> Students will:</p> <ul style="list-style-type: none"> <li>describe and extend arithmetic and geometric sequences;</li> <li>determine a specific term of a sequence given an explicit formula;</li> <li>determine an explicit rule for the <math>n</math>th term of an arithmetic sequence; and</li> <li>apply sequences to solve real-world problems.</li> </ul>
<b>Ratios and Proportional Reasoning</b>						
			<p><b>MA-06-1.4.1</b> Students will describe and apply ratios to solve real-world problems.</p>	<p><b>MA-07-1.4.1</b> Students will apply ratios and proportional reasoning to solve real-world problems (e.g., percents, sales tax, discounts, rate).</p>	<p><b>MA-08-1.4.1</b> Students will apply ratios and proportional reasoning to solve real-world problems (e.g., percents, constant rate of change, unit pricing, percent of increase or decrease).</p>	<p><b>MA-H11-1.4.1</b> Students will apply ratios, percents and proportional reasoning to solve real-world problems (e.g., those involving slope and rate, percent of increase and decrease) and will explain how slope determines a rate of change in linear functions representing real-world problems.</p>
<b>Properties of Numbers and Operations</b>						
<p><b>MA-EP-1.5.1</b> Students will identify and provide examples of odd numbers, even numbers, and multiples of numbers, and will apply these numbers to solve real-world problems.</p>	<p><b>MA-04-1.5.1</b> Students will identify and determine odd numbers, even numbers, multiples of numbers, and factors of a number, and will apply these numbers to solve real-world problems.</p>	<p><b>MA-05-1.5.1</b> Students will identify and determine composite numbers, prime numbers, multiples of a number, factors of numbers, and least common multiples (LCM), and will apply these numbers to solve real-world problems.</p>	<p><b>MA-06-1.5.1</b> Students will identify and apply prime numbers, composite numbers, prime factorization, factors, multiples, and divisibility to solve real-world problems (e.g., prime factorization to determine a least common multiple [LCM] or greatest common factor [GCF]).</p>	<p><b>MA-07-1.5.1</b> Students will identify and apply prime numbers, composite numbers, prime factorization, factors, multiples, and divisibility to solve real-world problems (e.g., prime factorization to determine a least common multiple [LCM] or greatest common factor [GCF]).</p>		<p><b>MA-H11-1.5.1</b> Students will identify real number properties (e.g., commutative, associative, distributive, identity and inverse) when used to justify a given step in simplifying an expression or solving an equation.</p>
			<p><b>MA-06-1.5.2</b> Students will identify how the commutative properties, the associative properties, and the identity properties for addition and multiplication are used to simplify numerical expressions.</p>	<p><b>MA-07-1.5.2</b> Students will identify how the commutative properties, the associative properties, and the identity properties for addition and multiplication are used to justify a given step in solving problems.</p>	<p><b>MA-08-1.5.2</b> Students will identify how the commutative properties, the associative properties, the distributive property, the identity properties for addition and multiplication, and inverse relationships justify a given step in solving problems.</p>	