



Fifth Grade End of Year Expectations

NUMERACY

By the end of the year students meeting grade level expectation will be able to:

Standards for Mathematical Practice	
Makes sense of problems and perseveres in solving them	<p>Solve problems by applying their understanding of mathematics, even when problems seem challenging.</p> <p>Seek the meaning of a problem and look for efficient ways to represent and solve it.</p> <p>Check their thinking by asking themselves, "What is the most efficient way to solve the problem?", "Does this make sense?", and "Can I solve the problem in a different way?".</p>
Constructs oral and written arguments and critiques the reasoning of others	<p>Construct mathematical arguments using concrete referents, such as objects, pictures, and drawings.</p> <p>Explain calculations based upon models and properties of operations and rules that generate patterns.</p> <p>Demonstrate and explain the relationship between mathematical concepts, such as volume and multiplication.</p> <p>Refine their mathematical communication skills as they participate in mathematical discussions involving questions like "How did you get that?" and "Why is that true?".</p> <p>Explain their thinking to others and respond to others' thinking.</p>
Communicates reasoning using clear and precise language, vocabulary, and notation	<p>Refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning.</p> <p>Use appropriate and concise terminology when referring to mathematical concepts and ideas. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, when figuring out the volume of a rectangular prism they record their answers in cubic units.</p>



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Operations and Algebraic Thinking

Writes and interprets mathematical expressions

Reason about the order in which operations need to be performed and can accurately solve problems and equations that employ the order of operations and parentheses.

Explain thinking as they use the order of operations to solve examples.

Given a mathematical expression in words, write the numerical expression, or given a numerical expression, translate it into words.

Analyzes patterns and relationships

Graph ordered pairs on a one quadrant coordinate plane and can reason to find similarities and determine rules to identify numerical and geometric patterns.

Given a rule, develop a list of numbers and describe patterns.

Numbers and Operations in Base Ten

Understands the place value system

Understand the relationship between adjacent places both to the left and to the right of a given place value. Students have a sense of magnitude of numbers and the relationship between the place values.

Write and interpret numbers to thousandths in standard and expanded form, and can also compare them.

Connect written notation with exponents to the structure of the place value system.

Performs operations with multi-digit whole numbers and with decimals to hundredths

Add, subtract and multiply whole numbers fluently, using flexible and efficient strategies including the US standard algorithm. They explain their reasoning when using a standard algorithm, which includes use of the properties of multiplication and place value.

Work with various division examples using developed efficient strategies for division (Note: the division algorithm is not expected nor explicitly taught until Grade 6).

Apply their understanding of the meaning of the operations to add, subtract, multiply and divide decimals.



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Number and Operations - Fractions

Uses equivalent fractions as a strategy to add and subtract fractions

Apply understanding of equivalent fractions to change given fractions in an addition and subtraction example to fractions with like denominators (note: least common denominator is not an expectation).

Explain their reasoning when finding like denominators.

Solve word problems for addition and subtraction problems with fractions and mixed numbers using visual models (number lines, area models, fraction strips), and explain their solution process.

Analyze answers using models and benchmark fractions to determine whether an answer is reasonable.

Applies and extends previous understandings of multiplication and division to fractions

Interpret a fraction as a division of the numerator and denominator and explain their reasoning.

Model and solve division problems in which they interpret the remainder as a fraction and explain their reasoning.

Use models to represent situations in which they need to multiply a whole number by a fraction or a fraction by a fraction and explain their reasoning. They can compare different strategies.

Look for patterns when multiplying fractions and explain why these patterns work using models, pictures, words and numbers. They apply these patterns to determine a procedure for multiplying fractions.

Measurement and Data

Converts like measurement units within a given measurement system

Convert different-sized measurement units within the same measurement system (customary and metric).

Solve word problems involving conversions of metric and customary units.

Represents and interprets data

Measure objects to one-eighth of a unit.

Construct a line plot with gathered information and display, analyze and interpret their own line plot.

Solve problems using operations on fractions on fractions from information presented.



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Measurement and Data (continued)

Understands concepts of volume and relates volume to multiplication and to addition

Understand that volume is an attribute of three-dimensional space and can be found by packing same-sized unit cubes within a rectangular prism.

Within real world problems, find the volume of a rectangular prism with whole-number side lengths by applying the formula $V=l \times w \times h$.

Select appropriate units, strategies and tools for solving problems that involve estimating and measuring volume.

Geometry

Graphs points on the coordinate plane to solve real-world and mathematical problems

Locate and graph coordinates on a coordinate grid by using ordered pairs of numbers.

Use specific vocabulary and directions to explain ordered pair locations.

Represent real world problems using coordinates on a coordinate plane.

Classifies two-dimensional figures into categories based on their properties

Explain reasoning about properties of shapes, and use appropriate vocabulary.

Sort and classify two-dimensional figures based on properties.

Compare and contrast the attributes of geometric shapes.