

Mathematics Assessment Framework

BOLD=Eligible for CRT

Grade 5

Italics=Classroom Assessment Only

Strand: NUMBER AND OPERATIONS

Standard: Students will understand numerical concepts and mathematical operations.

5-8 Benchmark: Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

- 1. Compare and order using *concrete* or illustrated models:**
 - whole numbers (to millions)**
 - common fractions (halves, thirds, fourths, eighths)**
 - decimals (thousandths)**
- 2. Demonstrate understanding of the magnitude of the value of numbers from thousandths to millions, including common fractions.**
- 3. Represent place value using *concrete* or illustrated models up to one billion (1,000,000,000).**
- 4. Interpret percents as part of a hundred (i.e., find decimal and percent equivalents for common fractions, explain how they represent the same value, and compute a given percent of a whole number).**
- 5. Identify and represent on a number line decimals, fractions, and mixed numbers.**
- 6. Identify prime and composite numbers to 50.**

5-8 Benchmark: Understand the meaning of operations and how they relate to one another.

- 1. Explain and perform whole number division and express remainders as a whole number or a fractional part as appropriate to the context of real-life problems.**
- 2. Add and subtract decimals.**
- 3. Add and subtract fractions and mixed numbers without regrouping and express answers in simplest form.**
- 4. Find the factors and multiples of whole numbers.**
- 5. Use arithmetic operations and inverse relationships to represent and solve real-world problems.**
- 6. Identify and represent on a number line decimals, fractions, and mixed numbers.**
- 7. Demonstrate proficiency with division, including one- and two-digit divisors.**
- 8. Solve simple problems involving the addition and subtraction of fractions and mixed numbers.**
- 9. Represent and use fractions and decimals in equivalent forms.**

5-8 Benchmark: Compute fluently and make reasonable estimates.

- 1. Add, subtract, multiply, and divide whole numbers.**
- 2. Add and subtract decimals.**
- 3. Use estimation strategies to verify the reasonableness of calculated results.**
- 4. Explain how the estimation strategy impacts the result.**
- 5. Relate the basic arithmetic operations to one another (e.g., multiplication and division are inverse operations).**
- 6. Simplify numerical expressions using order of operations.**
- 7. Recognize and explain the differences between exact and approximate values.**

<p>Strand: ALGEBRA Standard: Students will understand algebraic concepts and applications.</p>
<p>5-8 Benchmark: Understand patterns, relations, and functions.</p>
<ol style="list-style-type: none"> 1. Identify and graph ordered pairs in the first quadrant of the coordinate plane. 2. Describe, represent, and analyze patterns and relationships. 3. Identify, describe, and continue patterns presented in a variety of formats (e.g., numeric, visual, <i>oral</i>, written, <i>kinesthetic</i>, pictorial). 4. Generate a pattern using a written description.
<p>5-8 Benchmark: Represent and analyze mathematical situations and structures using algebraic symbols.</p>
<ol style="list-style-type: none"> 1. Compute the value of the expression for specific numerical values of the variable. 2. Use a letter to represent an unknown number. 3. Understand the differences between the symbols for “less than”, “less than or equal to”, “greater than”, and “greater than or equal to”.
<p>5-8 Benchmark: Use mathematical models to represent and understand quantitative relationships.</p>
<ol style="list-style-type: none"> 1. Use mathematical models to represent and explain mathematical concepts and procedures. 2. Understand and use mathematical models such as: <ul style="list-style-type: none"> • the number line to model the relationship between rational numbers and rational number operations • pictorial representation of addition and subtraction of rational numbers with regrouping • manipulatives or pictures to model computational procedures • graphs, tables, and charts to describe data • diagrams or pictures to model problem situations 3. Demonstrate how a situation can be represented in more than one way.
<p>5-8 Benchmark: Analyze changes in various contexts.</p>
<ol style="list-style-type: none"> 1. Recognize and create patterns of change from everyday life using numerical or pictorial representations. 2. Generalize patterns of change and recognize the same general patterns presented in different representations.
<p>Strand: GEOMETRY Standard: Students will understand geometric concepts and applications.</p>
<p>5-8 Benchmark: Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.</p>
<ol style="list-style-type: none"> 1. Identify, describe, and classify two-dimensional shapes and three-dimensional figures by their properties. 2. Recognize and describe properties of regular polygons having up to ten sides. 3. Identify faces, edges, and bases on three-dimensional objects.
<p>5-8 Benchmark: Specify locations and describe spatial relationships using coordinate geometry and other representational systems.</p>
<ol style="list-style-type: none"> 1. Recognize perpendicular and parallel lines.

5-8 Benchmark: Apply transformations and use symmetry to analyze mathematical situations.
1. Identify line of symmetry in simple geometric figures.
5-8 Benchmark: Use visualization, spatial reasoning, and geometric modeling to solve problems.
1. Understand and compute the perimeter of regular polygons. 2. Identify and explain circumference, radius, and diameter.
Strand: MEASUREMENT Standard: Students will understand measurement systems and applications.
5-8 Benchmark: Understand measurable attributes of objects and the units, systems, and processes of measurement.
1. Understand properties (e.g., length, area, weight, volume) and select the appropriate type of unit for measuring each using both U.S. customary and metric systems. 2. Select and use appropriate units and tools to measure according to the degree of accuracy required in a particular problem-solving situation. 3. Solve problems involving linear measurement, weight, and capacity (e.g., measuring to the nearest sixteenth of an inch or nearest millimeter; using ounces, milliliters, or pounds and kilograms) to the appropriate degree of accuracy. 4. Perform one-step conversions within a system of measurement (e.g., inches to feet, centimeters to meters).
5-8 Benchmark: Apply appropriate techniques, tools, and formulas to determine measurements.
1. Solve measurement problems using appropriate tools involving length, perimeter, weight, capacity, time, and temperature. 2. Select and use strategies to estimate measurements including length, distance, capacity, and time. 3. Apply strategies and use tools for estimating and measuring the perimeter of regular and irregular shapes.

Strand: DATA ANALYSIS AND PROBABILITY

Standard: Students will understand how to formulate questions, analyze data, and determine probabilities.

5-8 Benchmark: Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

1. Construct, read, analyze, and interpret tables, charts, graphs, and data plots.
2. Construct, interpret, and analyze data from graphical representations and draw simple conclusions using bar graphs, line graphs, circle graphs, frequency tables, and Venn diagrams.
3. Display, analyze, compare, and interpret different data sets, including data sets of different sizes.
4. Organize and display single-variable data in appropriate graphs and representations.
5. Organize, read, and display numerical (quantitative) and non-numerical (qualitative) data in a clear, organized, and accurate manner including correct titles, labels, and intervals or categories including:
 - frequency tables
 - stem and leaf plots
 - bar, line, and circle graphs
 - Venn diagrams
 - pictorial displays
 - charts and tables
6. Formulate questions and identify data to be collected to correctly answer a question.

5-8 Benchmark: Select and use appropriate statistical methods to analyze data.

1. Organize and display single-variable data in appropriate graphs and representations and determine which types of graphs are appropriate for various data sets.
2. Use fractions and percentages to compare data sets of different sizes.
3. Correctly rank the values of a numerical data set containing simple fractions and decimals, identify maximum and minimum data values, and calculate the range for a data set.

5-8 Benchmark: Develop and evaluate inferences and predictions that are based on data.

1. Make and justify valid inferences, predictions, and arguments based on statistical analysis.
2. Compare a given prediction with the results of an investigation.
3. Use counting strategies to determine all the possible outcomes of a particular familiar event.
4. Find all possible outcome sets involving four or more sets of objects.
5. Evaluate the reasonableness of inferences that are based on data in the context of the original solution.
6. Identify the method used to make an inference and/or a prediction on a given data set and solve similar problems.
7. Determine the accuracy of a prediction or an inference based on the accuracy of the data in a given data set.
8. List all possible outcomes of simple events.

5-8 Benchmark: Understand and apply basic concepts of probability.

- 1. Determine probabilities through *experiments and/or simulations* and compare the results with mathematical expressions.**
- 2. Make predictions from the results of *student-generated experiments* of single events.**
- 3. Identify simple experiments where the probabilities of all outcomes are equal.**
- 4. Describe and predict the results of a probability experiment.**
- 5. Use fractions to describe the results of an experiment.**
- 6. Use probability to generalize from a simple pattern or set of examples and justify why the generalization is reasonable.**

9-02-2004