PERFORMANCE STANDARDS FOR MATH: GRADE 1

A. Mathematical Processes

Content Standard: Students in Wisconsin will draw on a broad body of mathematical knowledge and apply a variety of mathematical skills and strategies, including reasoning, oral and written communication and the use of appropriate technology, when solving mathematical, real-world* and non-routine* problems.

Rationale: In order to participate fully as a citizen and a worker in our contemporary world, a person should be mathematically powerful. Mathematical power is the ability to explore, to conjecture, to reason logically and to apply a wide repertoire of methods to solve problems. Because no one lives and works in isolation, it is also important to have the ability to communicate mathematical ideas clearly and effectively.

Performance Standard

A.4.1 Use reasoning abilities to:

- perceive patterns
- identify relationships
- formulate questions for further exploration
- justify strategies
- test reasonableness of results

A.4.5 Explain solutions to problems clearly and logically in oral and written work and support solutions with evidence.

1st Grade:

1. Create and extend patterns. _____
2. Use comparative vocabulary to express relationships of size, amount and position. _____
3. Use the problem solving process (understand, plan, solve, check). _____
4. Apply the following problem-solving strategies:
   - choose an operation _____
   - use manipulatives _____
   - use a calculator _____
   - draw a picture _____
   - guess and check _____
   - identify needed/extra information _____
5. Justify strategies and solution through oral and written explanation. _____

Performance Standard

A.4.2 Communicate mathematical ideas in a variety of ways, including words, numbers symbols, pictures, charts, graphs, tables, diagrams and models*.

A. Mathematical Processes

1st Grade:

1. Communicate mathematical ideas in a variety of ways including: words, numbers pictures, symbols, graphs and charts. _____

Performance Standard

A.4.3 Connect mathematical learning with other subjects, personal experiences, current events and personal interests.

- see relationships between various kinds of problems and actual events
- use mathematics as a way to understand other areas of the curriculum (e.g., measurement in science, map skills in social studies)

1st Grade:

1. Connect mathematical learning with personal experiences, personal interests and other subjects. _____
2. Use mathematics as a way to understand other areas of the curriculum (e.g. measurement in science, map skills in social studies). _____

Performance Standard

A.4.4 Use appropriate mathematical vocabulary, symbols and notation with understanding based on prior conceptual work.

1st Grade:

1. Use and apply appropriate mathematical vocabulary, numerals, notation (number sentences) and symbols. _____

Vocabulary

1st Grade:

_____ problem solving process	_____ symbols	_____guess and check
_____ test	_____ explain	_____ calculator
_____ numeral	_____ number sentence	_____operations

B. Number Operations and Relationships

Content Standard: Students in Wisconsin will use numbers effectively for various purposes, such as counting, measuring, estimating and problem solving.

Rationale: People use numbers to quantify, describe and label things in the world around them. It is important to know the many uses of numbers and various ways of representing them. Number sense is a matter of necessity, not only in one's occupation but also in the conduct of daily life, such as shopping, cooking, planning a budget or analyzing information reported in the media. When computing, an educated person needs to know which operations (e.g., addition, multiplication), which procedures (e.g., mental techniques, algorithms*), or which technological aids (e.g., calculator, spreadsheet) are appropriate.

Performance Standard: Whole Numbers

B.4.1 Represent and explain whole numbers*, decimals and fractions with:

- physical materials
- number lines and other pictorial models*
- verbal descriptions
- place-value concepts and notation
- symbolic renaming (e.g., 43=40+3=30+13)

1st Grade:

1. Use and interpret number lines 0 to 20 and pictorial models. _____
2. Identify 1s and 10s place value. _____
3. Represent and explain whole numbers 0-100 with physical materials and verbal descriptions. _____
4. Symbolically rename numbers (i.e., 5 tens + 3 ones = 53, 10+3=13. _____
5. Read, write and order whole numbers to 100. _____
6. Analyze the use of numbers in real-life situations (newspaper articles, cereal box, catalogs…) _____

Performance Standard: Decimals

B.4.1 Represent and explain whole numbers*, decimals and fractions with:

- physical materials
- number lines and other pictorial models*
- verbal descriptions
- place-value concepts and notation
- symbolic renaming (e.g., 43=40+3=30+13)

B.4.7 In problem-solving situations involving money, add and subtract decimals.

B. Number Operations and Relationships

1st Grade:

Performance Standard: Fractions

B.4.1 Represent and explain fractions.

B.4.3 Read, write and order simple fractions and commonly used decimals.

B.4.4 Identify and represent equivalent fractions for halves, thirds, fourths, fifths, sixths, eighths, tenths, sixteenths.

B.4.6 Add and subtract fractions with like denominators.

1st Grade:

1. Compare and contrast equal and unequal parts. _____
2. Represent and identify fractions (1/2, 1/4, 1/3). _____
3. Compare and contrast fractions (1/2, 1/4). _____
4. Manipulate real-life objects to show equal parts. _____

Performance Standard:

B.4.5 In problem-solving situations involving whole numbers, select and efficiently use appropriate computational procedures such as:

- recalling the basic facts of addition, subtraction, multiplication and division
- using mental math (e.g., 37+25, 40x7)
- estimation
- selecting and applying algorithms* for addition, subtraction, multiplication and division
- using a calculator

1st Grade:

1. Recall basic facts of addition and subtraction through 12. _____
2. Solve basic mental math problems. _____
3. Use a calculator for problem-solving activities. _____
4. Solve one-step story problems. _____
5. Practice writing a number sentence to show a solution. _____

B. Number Operations and Relationships

Performance Standard

B.4.2 Determine the number of things in a set by:

- grouping and counting (e.g., by threes, fives, hundreds)
- combining and arranging (e.g., all possible coin combinations amounting to thirty cents)
- estimation, including rounding

1st Grade:

1. Determine the number of items in a set by counting and estimating quantities (up to 100). _____
2. Apply estimation skills to solve real-life problems. _____
3. Count by 1s to 100. _____
4. Count by 2s, 5s, 10s. _____
5. Identify penny, nickel, dime, quarter and half-dollar. _____
6. Identify and use the cent and dollar symbols.
7. Combine and arrange coin combinations (=30 cents). _____
8. Demonstrate the appropriate use of ordinal numbers (first, second, third…tenth). _____

Vocabulary

1st Grade:

_____ greater than	_____ ones	_____ dollar
_____ fractions	_____ less than	_____ tens
_____ grouping	_____ sum	_____ half-dollar
_____ estimation	_____ difference	_____ halves
_____ cent	_____ minus	_____ thirds
_____ numeral	_____ numerical order	_____ fourths
_____ number line	_____ number sentence	_____ plus
_____ even	_____ odd	

C. Geometry

Content Standard: Students in Wisconsin will be able to use geometric concepts, relationships and procedures to interpret, represent and solve problems.

Rationale: Geometry and its study of shapes and relationships is an effort to understand the nature and beauty of the world. While the need to understand our environment is still with us, the rapid advance of technology has created another need: to understand ideas communicated visually through electronic media. For these reasons, educated people in the 21st century need a well-developed sense of spatial order to visualize and model real world* problem situations.

Performance Standard

C.4.1 Describe two-and three-dimensional figures (e.g., circles, polygons, trapezoids, prisms, spheres) by:

- naming them
- comparing, sorting and classifying them
- drawing and constructing physical models to specifications
- identifying their properties (e.g., number of sides or faces, two- or three-dimensionality, equal sides, number of right angles)
- predicting the results of combining or subdividing two-dimensional figures
- explaining how these figures are related to objects in the environment
- employing appropriate grade level technology

1st Grade:

1. Identify and draw circles, squares, rectangles, triangles, ovals and diamonds. _____
2. Sort objects according to size and shape. _____
3. Identify polygon properties using number of sides and corners. _____
4. Identify and differentiate cubes, cones, cylinders and spheres. _____
5. Explain how shapes are related to objects in the environment.

Performance Standard:

C.4.2 Use physical materials and motion geometry (such as slides, flips and turns) to identify properties and relationships, including but not limited to:

- symmetry*
- congruence*
- similarity*

1st Grade:

1. Identify similar and congruent shapes and/or segments. _____
2. Show how a shape can be constructed based on the use of symmetry (heart). _____
3. Identify properties and relationships using motion geometry (slides, flips and turns).____

C. Geometry

Performance Standard:

C.4.3 Identify and use relationships among figures, including, but not limited to:

- location (e.g., between, adjacent to, interior of)
- position (e.g., parallel, perpendicular)
- intersection (of two-dimensional figures)

1st Grade:

1. Locate and identify relationships among figures (e.g., above, below, on, off, front, back, adjacent to, between, interior of, exterior of). _____
2. Demonstrate locations using concrete materials. (e.g., The red square is above the blue square...)._____
3. Apply appropriate vocabulary in real-life situations. _____

Performance Standard:

C.4.4 * Use simple two-dimensional coordinate systems to find locations on maps and to represent points and simple figures.

- Employ technology to place and locate points on a two-dimensional grid where grade appropriate.

1st Grade:

Vocabulary

1st Grade:

_____ solids
_____ slide
_____interior
_____ adjacent
_____ flip
_____ exterior
_____ turn

D. Measurement

Content Standard: Students in Wisconsin will select and use appropriate tools (including technology) and techniques to measure things to a specified degree of accuracy. They will use measurements in problem-solving situations.

Rationale: Measurement is the foundation upon which much technological, scientific, economic and social inquiry rests. Before things can be analyzed and subjected to scientific investigation, or mathematical modeling*, they must first be quantified by appropriate measurement principles. Measurable attributes* include such diverse concepts as voting preferences, consumer price indices, speed and acceleration, length, monetary value, duration of an Olympic race, or probability of contracting a fatal disease.

Performance Standard

D.4.1 Recognize and describe measurable attributes*, such as length, liquid capacity, time, weight (mass), temperature, volume, monetary value and angle size, and identify the appropriate units to measure them.

1st Grade:

1. Develop language skills to compare and contrast liquid capacity, weight, temperature, time, length and monetary values (more, less, greater, bigger, smaller, long, short, warm, cool). _____
2. Solve classroom problems using length, time, weight, and money. _____

Performance Standard

D.4.2 Demonstrate understanding of basic facts, principles and techniques of measurement, including:

- appropriate use of arbitrary* and standard units (metric and US customary)
- appropriate use and conversion of units within a system (such as yards, feet and inches; kilograms and grams; gallons, quarts, pints and cups)
- judging the reasonableness of an obtained measurement as it relates to prior experience and familiar benchmarks
- employment of appropriate grade level technology

1st Grade:

1. Use standard and non-standard units to compare, contrast, and estimate lengths, weights and capacity. _____

2. Apply logical reasoning to solve length, weight, and capacity problems. _____

D. Measurement

Performance Standard

D.4.3 Read and interpret measuring instruments (e.g., rulers, clocks, thermometers).

D.4.4 Determine measurements directly* by using standard tools to these suggested degrees of accuracy

- length to the nearest half-inch or nearest centimeter
- weight (mass) to the nearest ounce or nearest 5 grams
- temperature to the nearest 5 degrees
- time to the nearest minute
- monetary value to dollars and cents
- liquid capacity to the nearest fluid ounce

1st Grade:

1. Identify and explain the use of measurement tools including ruler, scale, thermometer, clock, calendar and coins. _____
2. Determine measurements to the following degrees of accuracy:
   - length to the nearest inch and centimeter _____
   - weight to the nearest pound _____
   - temperature to the nearest 5 degrees _____
   - time to the nearest hour and half-hour _____
   - monetary value to $0.30 _____
3. Name and order the days of the week and months of the year. _____

Performance Standard

D.4.5 Determine measurements by using basic relationships (such as perimeter and area) and approximate measurements by using estimation techniques.

1st Grade:

1. Predict which activities are more than one minute, about one minute and less than one minute. _____
2. Estimate, compare and contrast:
   - weight of an object to one pound _____
   - capacity of containers to cups _____
   - lengths to one inch _____
3. Apply estimation skills to solving real-life problems. _____

Vocabulary

D. Measurement

1st Grade :

_____ dollars	_____ greater	_____ weight	_____ heavier than
_____ thermometer	_____ less	_____ inch	_____ lighter than
_____ compare	_____ centimeter	_____ feet	_____ estimate
_____ minute	_____ balance	_____ length	_____ liter
_____ degrees	_____ pound		

E. Statistics and Probability

Content Standard: Students in Wisconsin will use data collection and analysis, statistics and probability in problem solving situations, employing technology where appropriate.

Rationale: Dramatic advances in technology have launched the world into the Information Age, when data are used to describe past events or predict future events. Whether in the business place or in the home, as producers or consumers of information, citizens need to be well versed in the concepts and procedures of data analysis in order to make informed decisions.

Performance Standard

E.4.1. Work with data in the context of real-world situations by:

- formulating questions that lead to data collection and analysis
- determining what data to collect and when and how to collect them
- collecting, organizing and displaying data
- drawing reasonable conclusions based on data

1st Grade:

1. Collect, organize and record real-world data. _____
2. Conduct a simple survey using tallies.

Performance Standard

E.4.2 Describe a set of a data using

- high and low values and range*
- most frequent value (mode*)
- middle value of a set of ordered data (median*)

1st Grade:

1. Describe orally and in a graphic a set of data using:

    - most frequent values _____
    - high and low values _____

Performance Standard

E.4.3 In problem-solving situations, read, extract and use information presented in graphs, tables or charts.

E. Statistics and Probability

1st Grade:

1. Identify and explain information in problem-solving situations using:

    - bar graphs _____
    - pictographs _____
    - tables _____
    - charts _____

Performance Standard
E.4.4 Determine if future events are more, less or equally likely, impossible or certain to occur.

1st Grade:

1. Experience the likelihood of future events by observation of simple activities. _____

Performance Standard
E.4.5 Predict outcomes of future events and test predictions using data from a variety of sources.

1st Grade:

1. Predict simple outcomes using a variety of sources. _____

Vocabulary

1st Grade:

_____ tally _____ survey

F. Algebraic Relationships

Content Standard: Students in Wisconsin will discover, describe and generalize simple and complex patterns and relationships. In the context of real-world problem situations, the student will use algebraic techniques to define and describe the problem to determine and justify appropriate solutions.

Rationale: Algebra is the language of mathematics. Much of the observable world can be characterized as having patterned regularity where a change in one quantity results in changes in other quantities. Through algebra and the use of variables* and functions*, mathematical models* can be built which are essential to personal, scientific, economic, social, medical, artistic and civic fields of inquiry.

Performance Standard

F.4.1 Use letters, boxes or other symbols to stand for any number, measured quantity or object in simple situations (e.g., N+0=N is true for any number).

F.4.2 Use the vocabulary, symbols and notation of algebra accurately (e.g., correct use of the symbol "="; effective use of the associative property of multiplication.

F.4.6 Recognize and use generalized properties and relationships of arithmetic (e.g., commutativity*, addition, inverse relationships of multiplication and division).

1st Grade:

1. Use vocabulary, symbols and notation of algebra correctly (+, _, =). _____
2. Read, write and solve number sentences. _____
3. Recognize and use basic properties of arithmetic:
   - Order (2+5=7/5+2=7)._____
   - Zero property for +/- (11+0=11/11-0=11). _____
   - Associative property for + [5+(3+2) or (5+3)+2]. _____
4. Provide the missing number in an addition or subtraction sentence (e.g., 6+_=8). _____
5. Show the relationship between +/- functions by completing "fact family" equations. ____

Performance Standard

F.4.3 Work with simple linear patterns and relationships in a variety of ways, including:

- recognizing and extending number patterns
- describing them verbally
- representing them with pictures, tables, charts, graphs
- recognizing that different models* can represent the same pattern or relationship
- using them to describe real-world phenomena
- employment of appropriate grade level technology

F. Algebraic Relationships

1st Grade:

1. Represent a pattern in multiple ways (objects, shapes, colors). _____
2. Recognize and extend a basic number pattern._____
3. Verbally describe a pattern. _____
4. Make and interpret pictures, pictographs, bar graphs, tables, charts and note patterns/relationships of the data. _____
5. Compare the same set of data shown on different models (pictures, graphs, charts). _____

Performance Standard

F.4.4 Recognize variability in simple functional* relationships by describing how a change in one quantity can produce a change in another (e.g., number of bicycles and the total number of wheels).

1st Grade:

1. Use pictures or objects to show changing relationships and quantities. _____
2. Interpret simple charts. _____
3. Use number line to count up or down.

Performance Standard

F.4.5 Use simple equations and inequalities in a variety of ways, including:

- using them to represent problem situations
- solving them by different methods (e.g., use of manipulatives, guess and check strategies, recall number facts).
- recording and describing solution strategies

1st Grade:

1. Use simple equations to represent basic math problems. _____
2. Use manipulatives to act out problem situations._____
3. Understand how to set up simple problems to find an answer in story problems. _____
4. Understand and recognize key words like "in all," "altogether," "left," and "difference" in order to apply appropriate algebraic operation. _____

Vocabulary

1st Grade:

_____ table	_____ addend	_____ chart
_____ sum	_____ story problem	_____ difference
_____ minus	_____ fact family	_____ equal sign
_____number sentence		