

# KEY LEARNINGS: MATHEMATICS CHART

2006-2008

*Standards of problem solving, reasoning, communications and representation are embedded in the teaching of the standards listed below.*

	Number and Operations	Algebra	Geometry	Measurement	Data Analysis and Probability
<b>K</b>	<ul style="list-style-type: none"> <li>Count to 20</li> <li>Write 0 to 10</li> <li>1-1 correspondence</li> <li>Add to 10</li> <li>Subtract to 10</li> </ul>	<ul style="list-style-type: none"> <li>Classification of objects</li> <li>Sort by time, size, numbers, etc.</li> <li>Compare and contrast objects</li> <li>Manipulatives to model problem</li> </ul>	<ul style="list-style-type: none"> <li>Compare by size, color, shape</li> <li>Identify triangles, squares, circles</li> <li>Describe position in space</li> <li>Fit puzzle pieces</li> <li>3-dimensional objects</li> </ul>	<ul style="list-style-type: none"> <li>Weight and capacity</li> <li>Length, size, distance, temperature</li> <li>Use of thermometer</li> <li>Order events by time</li> <li>Clocks, watches, calendars</li> <li>Time to hour</li> <li>Days of week</li> </ul>	<ul style="list-style-type: none"> <li>Events as likely/unlikely</li> </ul>
<b>1</b>	<ul style="list-style-type: none"> <li>Count, write 0 to 100</li> <li>Count by 2's, 5's, 10's, 25's to 100</li> <li>Skip count by 10's, e.g. 17, 27...</li> <li>Place value of tens and ones</li> <li>Fractions: <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{8}</math></li> </ul>	<ul style="list-style-type: none"> <li>Patterns</li> <li>Relationships</li> <li>Regularities</li> <li>Number lines and number sentences</li> </ul>	<ul style="list-style-type: none"> <li>Geometric terms and shapes</li> <li>Symmetry</li> </ul>	<ul style="list-style-type: none"> <li>Time to hour and half-hour</li> <li>Estimation and measures</li> <li>Standard and metric</li> <li>Coins to \$1.00</li> </ul>	<ul style="list-style-type: none"> <li>Analysis of data</li> <li>Predicted and actual outcomes</li> <li>Probability</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>3-digit numbers</li> <li>Skip count by 2's, e.g. 23, 25, 27...</li> <li>Ordinals 1-20</li> <li>Even and odd numbers</li> <li>Place value: hundreds, tens, ones</li> <li>Fact families</li> <li>+ and - facts to 20 by recall</li> <li>+ and - 2-digit, and 3-digit</li> <li>+ 3 numbers</li> <li>Round to nearest 10</li> <li>Write, + and - money</li> </ul>	<ul style="list-style-type: none"> <li>Patterns to make generalizations, predictions</li> <li>Patterns in tables and graphs</li> <li>Equivalence concepts using symbols</li> </ul>	<ul style="list-style-type: none"> <li>2- and 3- dimensional shapes</li> <li>Simple coordinates</li> <li>Prisms, pyramids, cylinders and cones</li> <li>Relate geometry to number and measurement</li> </ul>	<ul style="list-style-type: none"> <li>Measuring tools</li> <li>Units of measure</li> <li>Weight and capacity</li> <li>Tell time; A.M. and P.M.</li> <li>Coins and dollars to \$5.00</li> <li>Change to \$1.00</li> <li>Days, dates on calendar</li> <li>Week before, after on calendar</li> </ul>	<ul style="list-style-type: none"> <li>Simple bar graph</li> <li>Simple table and chart</li> <li>Predictions and validity</li> <li>Probability study with 50/50 chance</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>Place value to 10,000</li> <li>Number lines</li> <li>Skip count by 3's, e.g. 15, 18, 21...</li> <li>Commutative property of + and x</li> <li>Zero property of x</li> <li>Decimal point</li> <li>Tenths written as a decimal</li> <li>x and ÷ fact families</li> <li>+ and - 4-digit</li> <li>x mentally by 10 and 100</li> <li>x and ÷ 2-digit by 1-digit</li> <li>Fractions</li> <li>Simple mixed numbers</li> <li>+ and - fractions with like denominators</li> <li>+ and - money</li> <li>Estimate number computations</li> </ul>	<ul style="list-style-type: none"> <li>Patterns</li> <li>Equations and inequalities</li> <li>Solve equations and inequalities</li> <li>Commutative and associative properties</li> <li>Grouping symbols</li> </ul>	<ul style="list-style-type: none"> <li>Congruence and similarity</li> <li>Perimeter</li> <li>Count to find area and volume</li> <li>2-dimensional objects</li> <li>2- and 3- dimensional terms</li> <li>Label grid or coordinate system</li> <li>Tangrams</li> </ul>	<ul style="list-style-type: none"> <li>Measurement vocabulary</li> <li>Temperature</li> <li>Simple time line</li> <li>Metric and US units</li> <li>Money to \$10.00</li> <li>Tell time to the minute</li> <li>Calendar: day, week, month, year</li> <li>Weeks before and after on a calendar</li> </ul>	<ul style="list-style-type: none"> <li>Line graphs</li> <li>Graphs from a table</li> <li>Patterns in tables and graphs</li> <li>Data collection</li> </ul>
<b>4</b>	<ul style="list-style-type: none"> <li>Place value to 1,000,000</li> <li>Numbers between zero and one</li> <li>Decimals to the hundredths</li> <li>Equivalents in counting money</li> <li>x and ÷ relationship</li> <li>Remainder in division</li> <li>x and ÷ to 12 by recall</li> <li>÷ using 1-digit divisor</li> <li>x two 2-digit numbers</li> <li>Simple equivalent fractions</li> <li>Improper fractions, mixed numbers</li> <li>Estimate solutions</li> <li>Concept of LCM and GCF</li> <li>Reduce simple fractions</li> </ul>	<ul style="list-style-type: none"> <li>Table of values</li> <li>Change in variables</li> <li>Distributive property</li> <li>Predictions using numerical and non-numerical patterns</li> </ul>	<ul style="list-style-type: none"> <li>Points, lines, planes</li> <li>Positions on a grid</li> <li>Coordinate systems</li> <li>Line symmetry</li> <li>3-dimensional objects</li> <li>Area of rectangle</li> <li>Similarities and differences of quadrilaterals</li> </ul>	<ul style="list-style-type: none"> <li>Length to nearest <math>\frac{1}{4}</math> inch</li> <li>Multi-step problems</li> <li>Perimeter of irregular shapes</li> <li>Simple time line</li> <li>Time zones and timetables</li> <li>Celsius and Fahrenheit</li> <li>Equivalent measures for metric and customary units</li> </ul>	<ul style="list-style-type: none"> <li>Tables and graphs using different scales</li> <li>Circle graphs</li> <li>Probability experiments</li> <li>Venn diagrams</li> <li>Data collection</li> </ul>

	<b>Number and Operations</b>	<b>Algebra</b>	<b>Geometry</b>	<b>Measurement</b>	<b>Data Analysis and Probability</b>
<b>5</b>	<ul style="list-style-type: none"> <li>Place value to billions</li> <li>Count money and make change</li> <li>Whole numbers, fractions, decimals</li> <li>Number theory concepts</li> <li>Pairs of numbers</li> <li>Estimation and computation</li> <li>Round whole numbers</li> <li>Equivalent fractions, decimals, percents</li> <li>Multiples, factors, composites, primes</li> <li>GCF and LCM of two numbers</li> <li>Reduce and convert fractions</li> <li>+ and – time</li> </ul>	<ul style="list-style-type: none"> <li>Graph linear equations</li> <li>Interpret patterns</li> <li>Algebra formulas</li> <li>Linear equations</li> <li>Inequalities and nonlinear equations</li> </ul>	<ul style="list-style-type: none"> <li>Radius and diameter</li> <li>Angles</li> <li>Linear, square and cubic units</li> <li>Faces, vertices and edges</li> <li>Perspective drawings</li> <li>Ray, segment, interior and exterior of an angle</li> <li>Patterns with tessellations</li> </ul>	<ul style="list-style-type: none"> <li>Grid and coordinate plane</li> <li>3-dimensional objects</li> <li>Measure of angles</li> <li>Convert metric</li> <li>Measure length</li> </ul>	<ul style="list-style-type: none"> <li>Collect and display data</li> <li>Mean, median, mode and range</li> <li>Calculators and computers</li> <li>Predictions and conjectures based on samples</li> <li>Population and sample</li> <li>Outcomes of an event</li> <li>Frequency tables</li> </ul>
<b>6</b>	<ul style="list-style-type: none"> <li>Exponents</li> <li>Associative property of + and x</li> <li>Whole number operations to fractions, decimals, percents and mixed numbers</li> <li>Divisibility rules</li> <li>Round decimals to nearest 1,000ths</li> <li>Ratio, percent and percentage</li> <li>Improper fractions, mixed numbers and decimal fractions</li> <li>+, -, x and ÷ integers</li> <li>Prime factorization and factor trees</li> <li>Convert fractions to decimals to percents</li> <li>Convert fractions to terminating, repeating or rounded decimals</li> <li>Remainder as a fraction or decimal</li> <li>Find the percent of a number</li> </ul>	<ul style="list-style-type: none"> <li>Linear equations</li> <li>Two-step operations</li> <li>Solve inequalities</li> <li>Use a rule to determine a missing number</li> <li>Compare integers</li> </ul>	<ul style="list-style-type: none"> <li>Geometry vocabulary</li> <li>Area of triangles and parallelograms</li> <li>Circumference and area of circles</li> <li>Volume and surface areas of prisms</li> <li>Classify triangles</li> <li>Parallel, intersecting and perpendicular lines</li> <li>Use protractor</li> <li>Fractal patterns</li> <li>Geometric construction</li> </ul>	<ul style="list-style-type: none"> <li>Changed dimensions of a figure</li> <li>Formulas - circumference, area of circles and sectors</li> <li>Conversions within the same measurement system</li> <li>Indirect measurement</li> </ul>	<ul style="list-style-type: none"> <li>Calculate probability</li> <li>Multiple line graph</li> <li>Logical inferences from statistical data</li> <li>Calculate the odds</li> <li>Test a theoretical probability</li> <li>Construct a scatter plot</li> <li>Organized lists and tree diagrams</li> </ul>
<b>7</b>	<ul style="list-style-type: none"> <li>Scientific notation</li> <li>Negative and zero exponents</li> <li>Integers, rational and irrational numbers</li> <li>Additive inverse property</li> <li>Distributive property</li> <li>Properties of operations</li> <li>Proportions to solve problems</li> <li>Squares and square roots</li> <li>Percent of increase and decrease</li> </ul>	<ul style="list-style-type: none"> <li>Ratios, proportions, averages and percentages</li> <li>Graph inequalities</li> <li>Formula used in problem solving</li> <li>Laws of exponents</li> <li>Pythagorean Theorem</li> <li>Simple polynomials</li> </ul>	<ul style="list-style-type: none"> <li>Area of a trapezoid</li> <li>Cylinder surface area</li> <li>Geometric solid volume</li> <li>Transformations</li> <li>Angle measures in triangle</li> <li>Complementary, supplementary and vertical angles</li> <li>Scale diagrams</li> </ul>	<ul style="list-style-type: none"> <li>Convert between standard and metric measures</li> <li>Ratios to solve problems</li> <li>Scale models</li> <li>Ancient monetary values</li> <li>Proportionate time line</li> <li>Formulas for volume and surface areas of solids</li> <li>Time zones</li> </ul>	<ul style="list-style-type: none"> <li>Permutations</li> <li>Predictions</li> <li>Multiple bar graph</li> <li>Circle graphs</li> <li>Histogram</li> <li>Stem and leaf plot</li> </ul>
<b>8</b>	<ul style="list-style-type: none"> <li>Digits in calculations</li> <li>Irrational numbers</li> <li>Real numbers, set notation and set operations</li> </ul>	<ul style="list-style-type: none"> <li>Matrices</li> <li>Slope and intercept</li> <li>Values</li> <li>Arithmetic and geometric sequences</li> <li>Variables</li> <li>Linear or nonlinear properties in tables, graphs and equations</li> </ul>	<ul style="list-style-type: none"> <li>Surface area of various geometric shapes</li> <li>Volume of spheres</li> <li>Geometric properties</li> <li>Sine, cosine and tangent</li> </ul>	<ul style="list-style-type: none"> <li>Interior and exterior angles</li> <li>Digits in calculations</li> <li>Convert Fahrenheit and Celsius</li> </ul>	<ul style="list-style-type: none"> <li>Combinations from a given set</li> <li>Box and whisker plot</li> </ul>