



**Portsmouth School Department  
Power Standards in Math**

**Developed at the Portsmouth Summer  
Math Institute, August 2008**



## Kindergarten Math Power Standards

Numbers and Operations	M: N&O: K: 2: Count on by 1's to 100. M: N&O: K: 2: Count on by 10's to 100. M:N&O:K:2: Performs 1:1 counting of 20 or more objects. M:N&O:K:2: Read numbers up to 20. M:N&O:K:2: Write numbers up to 10. M:N&O:K:3, M:N:&O:K:6: Demonstrates conceptual understanding of join and take-away situations.
Data, Statistics, and Probability	M:DSP:K:1, M:DSP:K2: Use graphs to answer simple questions.
Geometry and Measurement	M:G&M:K:7: Use comparative language to describe attributes of objects. (taller/shorter) M:G&M:K:1: Identify figures: circle, triangle, square, rectangle, rhombus, and hexagon, trapezoid, oval
Functions and Algebra	M: F&A: K: 1: Extend, describe, extend, and create a pattern (visual, rhythmic, and movement) {ABAB}. M: G&M: K: 1: Use attributes to sort and classify objects.



## Grade 1 Math Power Standards

Numbers and Operations	<p>M:N&amp;O:1:1: Compare and order whole numbers up to 100.</p> <p>M:N&amp;O:1:2: Read, write, and model with manipulatives whole numbers up to 100; identify places in two digit numbers and the values of the digits in those places.</p> <p>M:N&amp;O:1:3: Understands addition and subtraction concepts.</p> <p>M:N&amp;O:1:5: Understands monetary value</p> <ul style="list-style-type: none"><li>• By knowing the names and values for coins</li><li>• Adding collections of like coins together to a sum no greater than \$1.00</li></ul>
Geometry and Measurement	<p>M:G&amp;M:1:1: Identify and name attributes plane figures including circles, triangles, squares, and rectangles.</p> <p>M:G&amp;M:1:8: Use a calendar to identify days, weeks, months, and dates; tell and show time to the nearest hour and <math>\frac{1}{2}</math> hour on an analog clock.</p>
Functions, Algebra	<p>M:F&amp;A:1:1: Extend and create numeric, visual and concrete patterns.</p> <p>M:F&amp;A:1:4: Uses the symbols +, -, and = to solve equations involving addition and subtraction.</p>
Data, Statistics, and Probability	<p>M:DSP:1:1: Use graphs to answer simple questions and draw conclusions; find the maximum and minimum of a data set.</p>



## Grade 2 Math Power Standards

Number and Operations	<p>M:N&amp;O:2:1: 1. Understand how to read and model the fractions <math>\frac{1}{2}</math> and <math>\frac{1}{4}</math> using wholes 2. Read, write, model with manipulatives, compare and order whole numbers up to 1,000; identify places in four digit numbers and the values of the digits in those places</p> <p>M:N&amp;O:2:2: Count on by 1's, 2's, 5's, 10's, 25's, to 100</p> <p>M:N&amp;O:2:2: Demonstrates automaticity with addition and subtraction fact families through 10 and quick recall up to 18</p> <p>M:N&amp;O:2:5: Demonstrates understanding of monetary value by adding coins together to a value no greater than \$1.99 and representing the result in dollar notation; recognizing equivalent coin representations of the same value, values up to \$1.99</p>
Geometry and Measurement	<p>M:G&amp;M:2:7: 1. Measures to the nearest half inch. 2. Tell time to the quarter hour on an analog clock.</p>
Functions and Algebra	<p>M:F&amp;A:2:4: Demonstrates conceptual understanding of equality by finding the value that will make an open sentence true (e.g., <math>2 + \_ = 7</math>). (limited to one operation and limited to use addition or subtraction)</p>
Data, Statistics, and Probability	<p>M:DSP:2:1: Analyze graphs in order to ask and answer simple questions and draw conclusions.</p>



## Grade 3 Math Power Standards

Numbers and Operations	<p>M:N&amp;O: 3:3/3:4/3:6: Know basic addition and subtraction facts (0-9) with automaticity and compute through two digit number models.</p> <p>M:N&amp;O:3/3/3:4/3:8: Know multiplication facts (0,1, 2,5,10) with automaticity and be able to represent through arrays</p> <p>M:N&amp;O:3:1/3:2: Understand how to model, compare, order and find equivalence in fractions (<math>\frac{a}{2}</math>, <math>\frac{a}{4}</math>) and model fractions (<math>\frac{a}{3}</math>, <math>\frac{a}{6}</math>)</p> <p>M:N&amp;O:3:1/3:4: Compare and order whole numbers using place value up to 10,000 and decimals within the context of money</p>
Geometry and Measurement	<p>M:G&amp;M:3:1/3:4/3:5: Be able to describe, compare and draw, triangles, squares, rectangles, rhombi, trapezoids, hexagons, circles, pentagons using geometric properties (line segments, vertices, angles, lines of symmetry) and identify 3D rectangular prisms</p> <p>M:G&amp;M:3:7: Measure to <math>\frac{a}{4}</math> of an inch and metric to nearest centimeter.</p> <p>M:G&amp;M:3:6: Demonstrate conceptual understanding of perimeter and area. Measure perimeter for any polygon and area of rectangles</p> <p>M:G&amp;M:3:8: Tell and show time to the nearest minute</p>
Functions and Algebra	<p>M:F&amp;A:3:4: Demonstrates conceptual understanding of equality by finding the value that will make an open sentence true (e.g., <math>2 + a = 6</math>, <math>3 + a = 7 + b</math>)</p>
Data, Statistics and Probability	<p>M:DSP:3:1, M:DSP:3:2, M:DSP:3:3: Read and analyze picture graphs, frequency graphs, bar graphs and line plots.</p>



## Grade 4 Math Power Standards

<p>Numbers and Operations</p>	<p>M:N&amp;O:4:1/4:2: Students should be proficient at demonstrating their understanding of place value to millions and decimals to the hundredths place, ordering and finding equivalent “easy fractions” and decimals.          Students will read, write, compare, and understand value of digits in big numbers (whole numbers)</p> <ul style="list-style-type: none"> <li>• <math>\frac{1}{2} = .5 = .50</math>      * <math>\frac{1}{2} = \frac{2}{4}</math></li> <li>• <math>\frac{1}{10}, \frac{1}{4}, \frac{1}{5}, \frac{1}{2}, \frac{3}{4} =</math> “Easy Fractions”</li> <li>• <math>23, 405 &lt; 23, 505</math></li> </ul> <p>M:N&amp;O:4:3/4:6: Students will demonstrate automaticity of basic addition, subtraction, and fact extensions. Demonstrate multiplication/division facts mastery (0-10)</p> <ul style="list-style-type: none"> <li>• <math>10 - 7 = 3</math> then <math>100 - 70 = 30</math></li> <li>• <math>4 * 5 = 20, 5 * 4 = 20, 20/4 = 5, 20/5 = 4</math></li> </ul> <p>M:N&amp;O:4:4: Students will be able to problem solve using three &amp; four digit addition and subtraction with regrouping, multiplication (0 – 10), and division turn-around facts using manipulatives, using paper pencil, mental math, and other appropriate strategies. Students will choose an efficient algorithm.</p>
<p>Geometry and Measurement</p>	<p>M:G&amp;M:4:1: Students will identify, draw, and describe the attributes of two dimensional shapes</p> <ul style="list-style-type: none"> <li>• points, intersecting &amp; parallel lines, rays, lines, line segments, right angles, circles, and polygons</li> </ul> <p>M:G&amp;M:4:7: Students will be able to accurately use tools to measure to the nearest <math>\frac{1}{4}</math> inch and <math>\frac{1}{2}</math> cm and accurately measure angles (right, acute, and obtuse).</p> <p>M:G&amp;M:4:6: Students will find perimeter of polygons and area of rectangles using manipulatives/formulas.</p>
<p>Functions and Algebra</p>	<p><b>M:F&amp;A:4:1:</b> Students will describe, create, and extend numeric patterns and use them to solve problems</p> <ul style="list-style-type: none"> <li>• frames and arrows, in/out boxes, number lines, and number sentences, number charts, etc.</li> </ul>
<p>Data, Statistics, and Probability</p>	<p>M:DSP:4:1: Students will read and interpret data to analyze charts, tables, bar graphs, line plots, and line graphs using landmarks of range, median, mode</p>



## Grade 5 Math Power Standards

Numbers and Operations	<p>M:N&amp;O:5:1: Students should be able to identify digits up to the billions and decimals down to the thousandths place.</p> <p>M:N&amp;O:5:3: Students should be proficient with comparing fractions and decimals and common percent, and with the addition and subtraction of fractions and decimals.</p> <p>M:N&amp;O:5:6: Students should be able to automatically recall multiplication and related division facts up to 12.</p> <p>M:N&amp;O:5:4: Students should develop fluency with efficient algorithms for multiplying and dividing whole numbers and understand why the procedures work. Students should also be able to add and subtract decimals.</p>
Geometry and Measurement	<p>M:G&amp;M:5:6: Students should be able to solve problems involving perimeter and area of triangles and all quadrilaterals having at least one pair of parallel sides.</p> <p>M:G&amp;M:2:7: Students should be able to estimate length and angles with and without tools.</p>
Data, Statistics, and Probability	<p>M:DSP:5:3: Students should be able to collect and organize data to create bar, line, and circle graphs and analyze these graphs using data landmarks.</p>
Problem Solving, Reasoning, and Proof	<p>Students should be able to transfer vocabulary and concepts to problem solving situations.</p>



## Grade 6 Math Power Standards

Numbers and Operations	<p>M:N&amp;O:6:4: Students will have mastered whole numbers and their operations including application in problem solving situations (<i>benchmark end of trimester 3 May/June</i>)</p> <p>M:N&amp;O:6:3/6:4: Students will have developed fluency with positive rational numbers and their operations including their use in problem solving situations (<i>benchmark end of trimester 2</i>)</p>
Geometry and Measurement	<p>M:G&amp;M:6:6: Students will apply the use of formulas to determine the area and perimeter of all polygons and circles (<i>benchmark end of trimester 3 May/June</i>)</p>
Data Statistics and Probability	<p>M:DSP:6:1:/6:3: Students will formulate questions, gather, organize, represent and analyze data.</p> <p>M:DSP:6:2: Students will interpret results with data and measures of central tendency (mean-median-mode) and range</p>



## Grade 7 Math Power Standards

Numbers and Operations	<p>M:N&amp;O:7:1/7:2: Students will demonstrate mastery of positive and negative rational numbers as they are used in operations, comparisons, ratios and application in problem solving (<i>benchmark end of term 2</i>)</p> <p>M:N&amp;O:7:4: Students will demonstrate mastery of proportional reasoning including tax, tips, discounts and rates and have the ability to evaluate the reasonableness of their answer (<i>benchmark end of term 3</i>)</p>
Geometry and Measurement	<p>M:G&amp;M:7:5: Students will be able to recognize similar figures and apply scale factors, side/length ratios and basic similarity transformations (<i>benchmark end of term 4</i>)</p> <p>M:G&amp;M:7:6: Students will apply the use of formulas to determine the surface area and volume of regular solids (<i>benchmark end of term 5</i>)</p>
Functions and Algebra	<p>M:F&amp;A:7:3/7:4: Students will recognize equivalent equations and solve two variable equations when one variable is known (<i>benchmark end of term 6</i>)</p>
Data Statistics and Probability	<p>M:DSP:7:5: Students will determine the theoretical and experimental probability of an event (<i>benchmark end of term 1</i>)</p>



## Grade 8 Math Power Standards

Geometry and Measurement	M:G&M:8:2: Students will apply the Pythagorean Theorem to find the missing side of a right triangle in problem solving situations ( <i>benchmark end of trimester 3</i> )
Functions and Algebra	M:F&A:8:3: Students will solve linear equations ( <i>benchmark end of trimester 1</i> )  M:F&A:8:1: Students will recognize problem situations in which two variables have a linear relationship and construct tables, graphs and equations that represent the linear relationship ( <i>benchmark end of trimester 1</i> )  M:F&A:8:2: Students will recognize a constant rate of change/slope and y-intercept in the three representations of the data (graph, table, equation) ( <i>benchmark end of trimester 3</i> )
Data Statistics and Probability	M:DSP:8:1: Students will interpret data and make predictions from tables and graphs ( <i>benchmark end of trimester 2</i> )  M:DSP:8:2: Students will compare sample distributions using measures of central tendency (mean or median), measures of dispersion, range or percentiles, and graphs that group data (histograms and box-whisker plots) ( <i>benchmark end of trimester 2</i> )



## High School Math Power Standards

1A.	<ul style="list-style-type: none"><li>• Mean, median, mode</li><li>• When are they appropriate</li><li>• Critical thinking</li><li>• How do apply for useful purpose (marketing)</li><li>• Read and relay precisely</li><li>• Using terms to compare yourself to others</li><li>• Explain and apply this vocabulary</li><li>• Explain why and how to do this (at young age)</li><li>• Define appropriate vocab.</li><li>• Use appropriate tools and technology</li></ul>
1B Charts and graphs	<ul style="list-style-type: none"><li>• Understand and interpret visual representations of information (What is it saying)</li><li>• Can you find the info (technology)</li><li>• Critical thinking</li><li>• Choose the appropriate graph for info.</li><li>• Know a variety</li><li>• Understand relationships</li><li>• Biased opinions</li><li>• Define appropriate vocab.</li><li>• Use appropriate tools and technology</li></ul>
1C Maps	<ul style="list-style-type: none"><li>• Decode, topical and demographic maps</li><li>• Draw conclusions</li><li>• Locate with longitude and latitude</li><li>• Understand and interpret visual representations of information</li><li>• Define appropriate vocab.</li><li>• Use appropriate tools and technology</li></ul>
2A Rates/ratios/percentages	<ul style="list-style-type: none"><li>• Determine tips and taxes (discount) percent change</li><li>• Apply to important daily and monetary decisions</li><li>• Understand common units</li><li>• Understand and interpret numerical representations of information</li><li>• Define appropriate vocab.</li><li>• Use appropriate tools and technology</li><li>• Relationships between %, fractions, and decimals</li></ul>

3A Geometry (As a component of Algebra 1) Measurements Strategies	<ul style="list-style-type: none"> <li>• Define appropriate vocab.</li> <li>• Use appropriate tools and technology</li> <li>• Measure to the nearest <math>\frac{1}{4}</math>"</li> <li>• Understand geometry in the context of the physical world</li> <li>• Conversions of volumes and weights</li> </ul>
3B Area and Perimeter	<ul style="list-style-type: none"> <li>• Define appropriate vocab.</li> <li>• Use appropriate tools and technology</li> <li>• Surface and volume</li> <li>• Determining square footage</li> <li>• Estimation of an irregular shape</li> <li>• Know where to find formulas</li> <li>• Calculate perimeter</li> <li>• Circle measurements</li> </ul>
4A Life Skills/Consumer Math	<ul style="list-style-type: none"> <li>• Apply 1-2-3 to appropriate life tasks</li> <li>• Use formulas and calculations for <ul style="list-style-type: none"> <li>○ Money, banking, investment and budgeting skills</li> <li>○ Understanding of taxes</li> </ul> </li> <li>• Define appropriate vocab.</li> <li>• Use appropriate tools and technology</li> </ul>
4B Number Sense	<ul style="list-style-type: none"> <li>• Define appropriate vocab.</li> <li>• Use appropriate tools and technology</li> <li>• Reasonable estimation</li> <li>• Orders of magnitude <ul style="list-style-type: none"> <li>○ Scientific notation</li> <li>○ Numerical prefixes</li> </ul> </li> </ul>
4C Order of operations	<ul style="list-style-type: none"> <li>• Define appropriate vocabulary</li> <li>• Use appropriate tools and technology</li> <li>• PEMDAS</li> </ul>
4D Equalities and inequalities	<ul style="list-style-type: none"> <li>• Define appropriate vocabulary.</li> <li>• Use appropriate tools and technology</li> <li>• Ability to solve for one and two variables (e.g. <math>\\$2x + \\$4g = \\$1500</math> \$2 for students, \$4 for adults)</li> </ul>
5A Experimental/Theoretical	<ul style="list-style-type: none"> <li>• Define appropriate vocabulary</li> <li>• Use appropriate tools and technology</li> <li>• Compare/contrast experimental and theoretical</li> </ul>
5B Independent /dependent	<ul style="list-style-type: none"> <li>• Define appropriate vocabulary</li> <li>• Use appropriate tools and technology</li> <li>• Ability to make reasonable predictions</li> <li>• Compare/contrast independent and dependent variables</li> <li>• Understand how variables affect outcome</li> </ul>