



# MathScape

Seeing and Thinking Mathematically

Course 2

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STANDARDS	PAGE REFERENCES
<p>A. <b>NUMBER:</b> Students use numbers in everyday and mathematical contexts to quantify or describe phenomena, develop concepts of operations with different types of numbers, use the structure and properties of numbers with operations to <i>solve</i> problems, and perform mathematical computations. Students develop number sense related to magnitude, estimation, and the effects of mathematical operations on different types of numbers. It is expected that students use numbers flexibly, using forms of numbers that best match a situation. Students compute efficiently and accurately. <i>Estimation</i> should always be used when computing with numbers or solving problems.</p>	
<p><b>Whole Number</b></p>	
<p><b>No performance indicator.</b> It is expected that students continue to use prior concepts and skills in new and familiar contexts.</p>	
<p><b>Rational Number</b></p>	
<p><b>Performance Indicators &amp; Descriptors</b></p>	
<p><b>1 Students use negative and positive rational numbers expressed as integers, fractions, and decimals.</b></p> <p>a. Recognize rational numbers as quotients of integers with a non-zero denominator and recognize that rational numbers can be negative or positive.</p> <p>b. Compare signed rational numbers and place them on the number line.</p>	<p><b>Student Edition:</b> 6-7, 10-11, 12-13, 16-17, 26-27, 28-29, 30-31, 34, 36, 38, 186-187, 213</p> <p><b>Teacher Guide:</b> 4-5, 6A, 7A, 10A, 26A, 30A, 186A</p>

STANDARDS	PAGE REFERENCES
<p><b>2 Students compute with signed rational numbers.</b></p> <p>a. Use and <i>interpret</i> exponents.</p> <p>b. Follow conventions of order of operations including exponents.</p> <p>c. Solve problems using signed rational numbers.</p>	<p><b>Student Edition:</b> 96-97, 98-99, 100-101, 102-103, 106-107, 108-109, 110-111, 112-113, 124-129, 130-131</p> <p><b>Teacher Guide:</b> 94-95, 99A, 102A, 104-105, 112A</p>
<p><b>3 Students <i>understand</i> that when the ratio of two varying quantities is constant, the two quantities are in direct proportion.</b></p> <p>a. Use ratios to compare quantities and use comparison to solve problems.</p> <p>b. Identify proportional relationships.</p> <p>c. Use proportions to <i>solve</i> problems.</p>	<p><b>Student Edition:</b> 16-17, 18-19, 20-21, 22-23, 38, 39, 40, 41, 142-143, 144-145, 169, 170</p> <p><b>Teacher Guide:</b> 14-15, 18A, 20A, 22A</p>
<p><b>4 Students <i>interpret</i> and use percents to solve problems.</b></p> <p>a. Use percents when comparing fractional parts of sets of unequal size.</p> <p>b. <i>Solve</i> practical problems involving percents.</p>	<p><b>Student Edition:</b> 26-27, 28-29, 30-31, 42-44, 162-163, 177</p> <p><b>Teacher Guide:</b> 24-25, 26A, 31A, 162A</p>
<p><b>Real Number</b></p>	
<p><b>No performance indicator.</b> Although no performance indicators are stated, students are expected to have instructional experiences in which they use rational numbers including rational approximations for pi or square roots</p>	
<p><b>B. DATA:</b> Students make measurements and collect, display, evaluate, analyze, and compute with data to describe or model phenomena and to make decisions based on data. Students compute statistics to summarize data sets and use concepts of probability to make predictions and describe the uncertainty inherent in data collection and measurement. It is expected that when working with measurements students:</p> <ul style="list-style-type: none"> <li>• understand that most measurements are approximations and that taking repeated measurements reveals this variability;</li> <li>• understand that a number without a unit is not a measurement, and that an appropriate unit must always be attached to a number to provide a measurement;</li> <li>• understand that the precision and accuracy of a measurement depends on selecting the appropriate tools and units; and</li> <li>• use estimation comparing measures to benchmarks appropriate to the type of measure and units.</li> </ul>	

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<b>Measurement and Approximation</b>	
<p><b>No performance indicator.</b> Although no performance indicators are stated at this level, it is expected that students continue to use prior concepts and skills in new and familiar concepts.</p>	
<b>Data Analysis</b>	
<b>Performance Indicators &amp; Descriptors</b>	
<p><b>1 Students use graphs and charts to represent, organize, <i>interpret</i>, and draw inferences from data.</b></p> <p>a. <i>Create</i> tables, pictograms, bar graphs, line graphs, pie charts, stem and leaf plots, box and whiskers plots, and histograms using pencil and paper and electronic technologies.</p> <p>b. Draw conclusions based on graphs and charts including tables, pictograms, bar graphs, line graphs, pie charts, stem and leaf plots, box and whiskers plots, and histograms.</p>	<p><b>Student Edition:</b> 8-9, 10-11, 28-29, 32-33, 35, 41, 43, 162-163, 177, 240-241, 244-245, 246-247, 248-249, 252-253, 254-255, 256-257, 262-269</p> <p><b>Teacher Guide:</b> 8A, 24-25, 29A, 33A, 241A, 242-243, 245A, 246A, 248A, 256A</p>
<b>Probability</b>	
<p><b>2 Students <i>understand</i> and apply concepts of probability to simple events.</b></p> <p>a. Describe events as likely or unlikely and discuss the concept of likelihood using such words phrases as “certain”, “equally likely”, and “impossible”.</p> <p>b. Predict the probability of outcomes of simple experiments and verify predictions using the <i>understanding</i> that the probability of an occurrence is the ratio of the number of actual occurrences to the number of possible occurrences.</p> <p>c. <i>Interpret</i> probabilities between and including zero and one and explain why zero and one are the upper and lower limits for probability values.</p>	<p><b>Student Edition:</b> 50-51, 52-53, 54-55, 58-59, 60-61, 62-63, 66-67, 70-71, 74-75, 78-79, 80-82, 84-85, 86, 88-89</p> <p><b>Teacher Guide:</b> 48-49, 52A, 53A, 56-57, 62A, 64-65, 70A, 71A, 75A</p>

STANDARDS	PAGE REFERENCES
<p><b>C. <u>GEOMETRY</u>:</b> Students use measurement and observation to describe objects based on their sizes and shapes; <i>model</i> or construct two-dimensional and three-dimensional objects; <i>solve</i> problems involving geometric properties; compute areas and volumes based on object properties and dimensions; and perform transformations on geometric figures. When making or calculating measures students use <i>estimation</i> to check the reasonableness of results.</p>	
<p><b>Geometric Figures</b></p>	
<p><b>Performance Indicators &amp; Descriptors</b></p>	
<p><b>1 Students <i>understand</i> angle properties of lines in the plane.</b></p> <p>a. Identify and name straight angles, angles at a point, and vertical angles and use these measures to find the measures of unknown angles.</p> <p>b. Recognize that the measures that form straight angles add to 180 degrees and the measures of angles at a point add to 360 degree and apply this property to solve problems.</p> <p>c. Recognize that vertical angles are congruent and apply this property to solve problems.</p>	<p><b>Student Edition:</b> 274-275, 276-277, 280-281, 303, 305</p> <p><b>Teacher Guide:</b> 272-273, 274A, 276A</p>
<p><b>Geometric Measurement</b></p>	
<p><b>Performance Indicators &amp; Descriptors</b></p>	
<p><b>2 Students <i>solve</i> problems involving perimeter and area.</b></p> <p>a. <i>Solve</i> problems involving the area and perimeter of regions in the plane bounded by line segments and circular arcs.</p> <p>b. <i>Solve</i> problems involving the area of combined figures.</p>	<p><b>Student Edition:</b> 146-147, 154-155, 164-165, 171, 174, 178, 294-295, 296-297, 298-299, 310-311</p> <p><b>Teacher Guide:</b> 137G, 138-139, 148-149</p>

STANDARDS		PAGE REFERENCES
<b>Transformations</b>		
<b>Performance Indicators &amp; Descriptors</b>		
<p><b>3 Students <i>understand</i> and use the concept of scale drawings to enlarge or reduce two-dimensional plane figures.</b></p> <p>a. Use the concept of scale factors when enlarging or reducing and recognize the invariance of shape.</p> <p>b. Apply the <i>understanding</i> that enlargement or reduction by a scale factor leaves angle measures unchanged.</p> <p>c. Identify similar figures and name corresponding parts.</p>	<p><b>Student Edition:</b> 140-141, 142-143, 144-145, 168-170, 280-281, 300-301, 305, 313</p> <p><b>Teacher Guide:</b> 138, 140A, 143A, 280A, 282-283, 300A</p>	
<p><b>D. <u>ALGEBRA</u>: Students use symbols to represent or <i>model</i> quantities, patterns, and relationships and use symbolic manipulation to <i>evaluate</i> expressions and <i>solve</i> equations. Students <i>solve</i> problems using symbols, tables, graphs, and verbal rules choosing the most effective representation and converting among representations.</b></p>		
<b>Symbols and Expressions</b>		
<b>Performance Indicators &amp; Descriptors</b>		
<p><b>1 Students <i>create</i> and <i>evaluate</i> expressions.</b></p> <p>a. <i>Create</i> and <i>evaluate</i> expressions using integers.</p> <p>b. <i>Create</i> and <i>evaluate</i> expressions using rational numbers.</p>	<p><b>Student Edition:</b> 184-185, 188-189, 212, 214</p> <p><b>Teacher Guide:</b> 183</p>	
<b>Equations and Inequalities</b>		
<b>Performance Indicators &amp; Descriptors</b>		
<p><b>2 Students <i>understand</i> and <i>solve</i> problems involving linear equations and know that a linear equation can be written in the form <math>0 = ax + b</math>.</b></p> <p>a. <i>Solve</i> equations of the form <math>ax + b = c</math> where a, b, and c are positive rational numbers or positive or negative integers.</p> <p>b. Convert equations to <math>0 = ax + b</math> form.</p>	<p><b>Student Edition:</b> 204-205, 208-209, 220-222</p> <p><b>Teacher Guide:</b> 202-203, 204A</p>	

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<b>Functions And Relations</b>		
<b>Performance Indicators &amp; Descriptors</b>		
<p><b>3</b> Students <i>understand</i> and use directly proportional relationships, <math>y = kx</math>.</p> <p>a. Recognize directly proportional relationships by information in a table, graph, or formula.</p> <p>b. Translate common directly proportional relationships into symbolic statements and graphs.</p> <p>c. <i>Interpret</i> the slope and y-intercept of the graph of <math>y = kx</math> in terms of a given context.</p>	<p>See <i>MathScape: Seeing and Thinking Mathematically, Course 3</i>.</p> <p><b>Student Edition:</b> 240-247, 262-264, 275-276, 303</p>	