



# Mathematics

Applications and Concepts  
Course 2  
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STANDARDS	PAGE REFERENCES
Grade 7	
<b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b> Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.	
<b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b>	
<b>Students should...</b> 1.1 Understand and describe patterns and functional relationships.	
<p>a. Analyze physical phenomena and patterns to identify relationships and make generalizations.</p> <p><b>(1)</b> Generalize mathematical situations and patterns with algebraic expressions, equations and inequalities.</p> <p><b>(2)</b> Identify the independent and dependent variables in a given situation.</p> <p><b>(3)</b> Recognize and explain when a graph should be continuous or a discrete set of points.</p>	<p><b>Student Edition:</b> 150-152, 159 #42, 163 #48-#51, 170 #4-#5, 174 #32-#33, 177-181, 182-185, 188 #54-#62, 189 #13-#15</p> <p><i>Hands-On Lab</i> 176</p> <p><b>Teacher Wraparound Edition:</b> A 152, 181; B 182; DI 150, 177, 183</p>

STANDARDS	PAGE REFERENCES
<b>1.2 Represent and analyze quantitative relationships in a variety of ways.</b>	
<p>a. Describe the effects of characteristics of mathematical relationships on the way the relationships are represented.</p> <p><b>(1)</b> Use graphs, tables, equations and verbal descriptions to represent and analyze changes in linear and nonlinear relationships.</p> <p><b>(2)</b> Recognize that a linear relationship has a constant rate of change.</p>	<p><b>Student Edition:</b> 34-36, 41 #47-#50, 45 #50, 48 #44-#47, 49 #2, 50 #7, 51 #17, 177-181</p> <p><i>Hands-On Lab</i> 37 #47-#50</p> <p><b>Teacher Wraparound Edition:</b> A 36, 181; B 34; DI 35; ICE 178, 179</p>
<b>1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.</b>	
<p>a. Solve problems using a variety of algebraic methods.</p> <p><b>(1)</b> Solve problems using concrete, verbal, symbolic, graphical and tabular representations.</p>	<p><b>Student Edition:</b> 156-159, 160-163, 166-169, 170 #6-#14</p> <p><i>Hands-On Lab</i> 154-155</p> <p><b>Teacher Wraparound Edition:</b> A 159, 163; B 156, 166; DI 157, 161; ICE 157, 159, 161</p>
<p>b. Maintain equivalence in equations to determine solutions.</p> <p><b>(1)</b> Model and solve one-step and two-step linear equations using a variety of methods.</p>	<p><b>Student Edition:</b> 156-159, 160-163, 166-169, 170 #6-#14</p> <p><i>Hands-On Lab</i> 154-155</p> <p><b>Teacher Wraparound Edition:</b> A 159, 163; B 156, 166; DI 157, 161; ICE 157, 159, 161</p>

STANDARDS	PAGE REFERENCES
<p><b>NUMERICAL AND PROPORTIONAL REASONING:</b> Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.</p>	
<p><b>How are quantitative relationships represented by numbers?</b></p>	
<p><b>Students should...</b>  <b>2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.</b></p>	
<p>a. Represent real-world situations and solutions to problems using the appropriate symbolic form (fractions, decimals or percents).</p> <p>(1) Rewrite a rational number in its equivalent fraction, decimal, ratio and percent forms with number patterns and common factors.</p> <p>(2) Identify and classify fractions as terminating or repeating decimals.</p> <p>(3) Estimate and perform computations with fractions, decimals, mixed numbers, improper fractions, ratios, proportions and percents.</p> <p>(4) Multiply and divide mixed numbers and decimals using the distributive property.</p> <p>(5) Use and describe appropriate methods to divide by a fraction or a decimal.</p> <p>(6) Solve practical problems involving rates, scale factors, mixtures and percents with proportions.</p> <p>(7) Estimate to predict outcomes and determine reasonableness of results, and describe whether an estimate is an over- or underestimate.</p>	<p><b>Student Edition:</b>  211, 212 #22-#23, 214 #14, 219 #57-#59, 233 #30-#31, 235 #7, 244-247, 248-251, 254-257, 264-266</p> <p><b>Teacher Wraparound Edition:</b>  A 213; B 210; DI 211; ICE 211; WM 212</p>
<p>b. Understand the use of scientific notation as related to powers of ten as an efficient method for writing and comparing very large numbers.</p> <p>(1) Use powers of ten and positive exponents to express and compare magnitude of very large numbers and connect to scientific notation.</p> <p>(2) Develop, describe and use a variety of methods to estimate and calculate with very large numbers.</p>	<p><b>Student Edition:</b>  43-45, 48 #53-#60, 49 #22-#24, 50 #9, 51 #16, 57 #22-#25, 63 #18</p> <p><b>Teacher Wraparound Edition:</b>  A 45; DI 43; ICE 44; NS 44</p>
<p>c. Use percents to make comparisons between groups of unequal size.</p> <p>(1) Estimate and find percents, including percents greater than 100 percent and less than 1 percent using number patterns and the distributive property.</p> <p>(2) Find what percent one amount is of another amount using a variety of strategies.</p>	<p><b>Student Edition:</b>  334-337, 340-343, 353 #36-#37, 354-357, 362 #11-#19, 363 #20-#24</p> <p><b>Teacher Wraparound Edition:</b>  A 337, 343; B 340; DI 335, 341; ICE 336, 355; NS 336</p>

STANDARDS	PAGE REFERENCES
<p><b>2.2 Use numbers and their properties to compute flexibly and fluently, and to reasonably estimate measures and quantities.</b></p>	
<p>a. Extend the operations of addition, subtraction, multiplication and division to negative numbers.</p> <p>(1) Solve problems with positive and negative numbers using models and number lines.</p> <p>(2) Use the order of operations to compute and solve a variety of multistep problems, including those with parentheses and exponents.</p> <p>(3) Explore absolute value while solving problems involving distance.</p>	<p><b>Student Edition:</b> 120-124, 128-131, 134-137, 138-141, 244-247, 248-251</p> <p><i>Hands-On Lab</i> 126-127</p> <p><b>Teacher Wraparound Edition:</b> A 124, 137, 141; B 120, 128; DI 121; ICE 121; TNT 121</p>
<p><b>GEOMETRY AND MEASUREMENT</b></p> <p>Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.</p>	
<p>How do geometric relationships and measurements help us to solve problems and make sense of our world?</p>	
<p>Students should...</p> <p><b>3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.</b></p>	
<p>a. Describe and classify polygons according to their transformational properties.</p> <p>(1) Identify which classes of polygons have line and/or rotational symmetry.</p> <p>(2) Use rectangular grids to represent polygons and perform transformations (translations, rotations, reflections and dilations) on these polygons.</p> <p>(3) Describe the effect of transformations on polygons with line and/or rotational symmetry.</p>	<p><b>Student Edition:</b> 451-454, 456-459, 460-461, 464 #26-#31, 465 #15, 467 #18, 473 #48-#49, 477 #40</p> <p><b>Teacher Wraparound Edition:</b> A 459; B 456; DI 451; ICE 452, 457</p>
<p><b>3.2 Use spatial reasoning, location and geometric relationships to solve problems.</b></p>	
<p>a. Understand how three-dimensional objects can be represented in two dimensions using base plans (footprints), orthogonal views, nets and isometric drawings.</p> <p>(1) Draw and interpret nets, cross-sections and front, side and top views of various solids.</p> <p>(2) Develop and use strategies to determine the surface area of three-dimensional objects.</p>	<p><b>Student Edition:</b> 512-513, 514-517, 518, 520, 528 #3-#5, 530-531, 532 ex 1, 546 #9-#11, 549 #3-#5, 550 #5, 551 #19</p> <p><b>Teacher Wraparound Edition:</b> A 517; B 514; DI 515; ICE 515</p>

STANDARDS	PAGE REFERENCES
<p><b>3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.</b></p>	
<p>a. Solve geometric and measurement problems through the use of a variety of tools, techniques and strategies.</p> <p>(1) Use estimation and measurement strategies to solve problems involving the areas of irregular polygons and volumes of irregular solids.</p>	<p><b>Student Edition:</b> 498-500, 503 #18, 506 #40-#43, 507 #12-#13, 509 #18, 517 #27-#29</p> <p><b>Teacher Wraparound Edition:</b> A 500; B 498; DI 499; ICE 499; PS 507</p>
<p><b>WORKING WITH DATA: PROBABILITY AND STATISTICS</b></p> <p>Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.</p>	
<p><b>How can collecting, organizing and displaying data help us analyze information and make reasonable predictions and informed decisions?</b></p>	
<p><b>Students should...</b></p> <p><b>4.1 Collect, organize and display data using appropriate statistical and graphical methods.</b></p>	
<p>a. Select the appropriate visual representation of data based on the kind of data collected and the purpose for its use.</p> <p>(1) Formulate questions, design surveys and samplings, organize and analyze gathered data and defend the analysis.</p> <p>(2) Organize and display data using appropriate graphical representations and make and defend predictions based on patterns and trends.</p>	<p><b>Student Edition:</b> 76-79, 80-83, 85-89, 97 #20-#23 <i>Graphing Calculator Investigation</i> 84 <i>Spreadsheet Investigation</i> 90-91</p> <p><b>Teacher Wraparound Edition:</b> A 79, 82, 89; DI 77, 80; ICE 77, 78, 81, 82</p>
<p><b>4.2 Analyze data sets to form hypotheses and make predictions.</b></p>	
<p>a. Understand that measures of central tendency and spread can be used to describe data sets and justify conclusions.</p> <p>(1) Find, use and interpret measures of central tendency and spread, including mode, median, mean, range and outliers.</p> <p>(2) Compare two sets of data based on their distributions and measures of central tendency.</p>	<p><b>Student Edition:</b> 69-72, 74 #12-#13, 79 #26-#27, 95 #19, 97 #16-#19, 99 #7-#8, 100 #6, 101 #12 <i>Hands-On Lab</i> 73</p> <p><b>Teacher Wraparound Edition:</b> A 72; B 69; DI 69, 70; ICE 70; T 73</p>

## STANDARDS

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**4.3 Understand and apply basic concepts of probability.**

a. Compare and determine experimental and theoretical probabilities.

**(1)** Identify the two ways of obtaining probabilities: by gathering data from experiments (experimental probability); and by analyzing the possible and likely outcomes (theoretical probability).

**(2)** Conduct experiments and compare experimental to theoretical probabilities.

**(3)** Solve problems involving the probability of simple and compound events in familiar contexts.

**Student Edition:**

378-380, 393-396, 398-401, 404 #36-#39, 405 #16, 406 #8, 415 #29

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**Teacher Wraparound Edition:**

A 395, 401; B 393, 398; DI 375, 394, 399