



MATHEMATICS: APPLICATIONS AND CONCEPTS, ©2004 COURSE 1  
Kansas  
Kansas Mathematics Curriculum Standards  
Grade Six

CONTENT STANDARDS	PAGE REFERENCES
<b>Standard 1: Number and Computation</b> <b>The student uses numerical and computational concepts and procedures in a variety of situations.</b>	
<b>Benchmark 1: Number Sense</b> <b>The student demonstrates number sense for rational numbers and simple algebraic expressions in one variable in a variety of situations.</b> <b>Sixth Grade Knowledge Base Indicators</b> The student...	
1. knows, explains, and uses equivalent representations for rational numbers expressed as fractions, terminating decimals, and percents; positive rational number bases with whole number exponents; time; and money (2.4.K1a-c) \$.	SE: 18, 19, 102–103, 109, 136, 182–183, 186–187, 202–203, 206, 400–401, 404–405  TWE: 18, 19, 102–103, 109, 136, 182–183, 186–187, 202–203, 206, 400–401, 404–405
2. compares and orders (2.4.K1a-c) \$:	
a. integers;	SE: 295, 296–297  TWE: 295, 296–297
b. fractions greater than or equal to zero,	SE: 198–199, 200–201  TWE: 198–199, 200–201
c. decimals greater than or equal to zero through thousandths place.	SE: 108–109, 110  TWE: 108–109, 110
3. explains the relative magnitude between whole numbers, fractions greater than or equal to zero, and decimals greater than or equal to zero (2.4.K1a-c).	The opportunity to address this objective is available. See the following:  SE: 108–109, 110, 198–199, 200–201, 588  TWE: 108–109, 110, 198–199, 200–201, 588
4. knows and explains numerical relationships between percents, decimals, and fractions between 0 and 1 (2.4.K1a,c), e.g., recognizing that percent means out of a 100, so 60% means 60 out of 100, 60% as a decimal is .60, and 60% as a fraction is 60/100.	SE: 102–103, 202–203, 206, 400–401, 404–405  TWE: 102–103, 202–203, 206, 400–401, 404–405

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5. uses equivalent representations for the same simple algebraic expression with understood coefficients of 1 (2.4.K1a), e.g., when students are developing their own formula for the perimeter of a square, they combine $s + s + s + s$ to make $4s$ .	SE: 29, 136, 266, 276–277 TWE: 29, 136, 266, 276–277
<b>Sixth Grade Application Indicators</b> The student...	
1. generates and/or solves real-world problems using equivalent representations of (2.4.A1a-c) \$:	
a. integers, e.g., the basketball team made 15 out of 25 free throws this season. Express their free throw shooting as a fraction and as a decimal.	SE: 182, 202, 206, 400, 401 TWE: 182, 202, 206, 400, 401
b. fractions greater than or equal to zero, e.g., the basketball team made 15 out of 25 free throws this season, express their free throw shooting as a fraction.	SE: 182, 202, 400, 401 TWE: 182, 202, 400, 401
c. decimals greater than or equal to zero through thousandths place (2.4.1a), e.g., the basketball team made 15 out of 25 free throws this season, express their free throw shooting as a decimal.	SE: 206 TWE: 206
2. determines whether or not solutions to real-world problems that involve the following are reasonable \$.	
a. integers (2.4.A1a), e.g., the football is placed on your own 10-yard line with 90 yards to go for a touchdown. After the first down, your team gains 7 yards. On the second down, your team loses 4 yards; and on the third down your team gains 2 yards. Is it reasonable for the football to be placed on the 5 yard line for the beginning of the fourth down? No, you have gained more than you have lost.	The opportunity to address this objective is available. See the following: SE: 300, 303, 307, 311, 312, 313, 317, 318, 319 TWE: 300, 303, 307, 311, 312, 313, 317, 318, 319
b. fractions greater than or equal to zero (2.4.A1c), e.g., Gary, Tom, and their parents are selling greeting cards. Gary receives $\frac{1}{3}$ of the profit and Tom receives $\frac{1}{4}$ of the profit. Is it reasonable that together they received $\frac{2}{7}$ of the profits?	SE: 182, 183, 198, 199, 202, 203, 229, 236, 241, 244, 261, 265, 270, 272, 273, 276, 277, 401 TWE: 182, 183, 198, 199, 202, 203, 229, 236, 241, 244, 261, 265, 270, 272, 273, 276, 277, 401

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c. decimals greater than or equal to zero through thousandths place (2.4.A1c), e.g., the beginning bank balance is \$250.40 A deposit of \$175, a withdrawal of \$198, and a \$2 service charge are made. The checkbook balance reads \$127.40. Is this a reasonable balance? Why or why not?	The opportunity to address this objective is available. See the following:  SE: 116, 117, 121, 122, 135, 141, 142, 145, 153, 206, 207  TWE: 116, 117, 121, 122, 135, 141, 142, 145, 153, 206, 207
<b>Benchmark 2: Number Systems and Their Properties</b> <b>The student demonstrates an understanding of the rational number system and the irrational number pi; recognizes, uses, and describes their properties; and extends these properties to algebraic expressions in one variable.</b>	
<b>Sixth Grade Knowledge Base Indicators</b> The student...	
1. classifies subsets of the rational number system as counting numbers, whole numbers, integers, fractions (including mixed numbers), or decimals (2.4.K1a,c,k).	SE: 186, 294, 586  TWE: 186, 294, 586
2. identifies prime and composite numbers and explains their meaning (2.4.K1d).	SE: 14–17  TWE: 14–17
3. uses and describes these properties with the rational number system and demonstrates their meaning including the use of concrete objects (2.4.K1a) \$:	
a. commutative and associative properties of addition and multiplication (commutative – changing the order of the numbers does not change the solution; associative – changing the grouping of the numbers does not change the solution);	SE: 334  TWE: 334
b. identity properties for addition and multiplication (additive identity – zero added to any number is equal to that number; multiplicative identity – one multiplied by any number is equal to that number);	SE: 334  TWE: 334
c. symmetric property of equality, e.g., $24 \times 72 = 1,728$ is the same as $1,728 = 24 \times 72$ ;	This objective is taught in Glencoe <i>Pre-Algebra</i> ©2003 SE: 29, 30, 31
d. zero property of multiplication (any number multiplied by zero is zero);	This objective is taught in Glencoe <i>Pre-Algebra</i> ©2003 SE: 24, 49, 61, 725
e. distributive property (distributing multiplication or division over addition or subtraction), e.g., $26(9 + 15) = 26(9) + 26(15)$ ;	SE: 332, 333–334  TWE: 332, 333–334

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f. substitution property (one name of a number can be substituted for another name of the same number), e.g., if $a = 3$ and $a + 2 = b$ , then $3 + 2 = b$ ;	This objective is taught in Glencoe <i>Pre-Algebra</i> ©2003 SE: 107, 379, 413, 416, 417, 418, 428, 440, 744
g. addition property of equality (adding the same number to each side of an equation results in an equivalent equation – an equation with the same solution), e.g., if $a = b$ , then $a + 3 = b + 3$ ;	SE: 345  TWE: 345
h. multiplication property of equality (for any equation, if the same number is multiplied to each side of that equation, then the new statement describes an equation equivalent to the original), e.g., if $a = b$ , then $a \times 7 = b \times 7$ ;	This objective is taught in Glencoe <i>Mathematics: Applications And Concepts, Course 2</i> ©2004 SE: 259, 262 #16-#18, 279 #41-#43
i. additive inverse property (every number has a value known as its additive inverse and when the original number is added to that additive inverse, the answer is zero), e.g., $+5 + (-5) = 0$ .	The opportunity to address this objective is available. See the following:  SE: 296, 339, 344  TWE: 296, 339, 344
4. recognizes and explains the need for integers, e.g., with temperature, below zero is negative and above zero is positive; in finances, money in your pocket is positive and money owed someone is negative.	SE: 294–296  TWE: 294–296
5. recognizes that the irrational number pi can be represented by an approximate rational value, e.g., $22/7$ or 3.14.	SE: 162  TWE: 162
<b>Sixth Grade Application Indicators</b> The student...	
1. generates and/or solves real-world problems with rational numbers using the concepts of these properties to explain reasoning (2.4.A1a-c,e) \$:	
a. commutative and associative properties for addition and multiplication, e.g., at a delivery stop, Sylvia pulls out a flat of eggs. The flat has 5 columns and 6 rows of eggs. Show two ways to find the number of eggs: $5 \cdot 6 = 30$ or $6 \cdot 5 = 30$ .	SE: 334–335  TWE: 334–335
b. additive and multiplicative identities.	The opportunity to address this objective is available. See the following:  SE: 334  TWE: 334

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<p>c. symmetric property of equality, e.g., Sam took a \$15 check to the bank and received a \$10 bill and a \$5 bill. A \$15 check is the same amount as a \$10 bill and a \$5 bill.</p>	<p>This objective is taught in Glencoe <i>Pre-Algebra</i> ©2003 SE: 30, 31</p>
<p>d. distributive property, e.g., trim is used around the outside edges of a bulletin board with dimensions 3 ft by 5 ft. Show two different ways to solve this problem: <math>2(3 + 5) = 16</math> or <math>2 \cdot 3 + 2 \cdot 5 = 6 + 10 = 16</math>. Then explain why the answers are the same.</p>	<p>SE: 334 TWE: 334</p>
<p>e. substitution property, e.g., <math>V = IR</math> [Ohm's Law –voltage (V) = current (I) x resistance (R)] If the current is 5 amps (<math>I = 5</math>) and the resistance is 4 ohms (<math>R = 4</math>), what is the voltage? Substitute values for I and R. To find the voltage:  <math>V = IR,</math>  <math>V = 5 \cdot 4</math>  <math>V = 20</math></p>	<p>The opportunity to address this objective is available. See the following: (When the definition is given, the substitution property could be used.)  <math>d=rt</math>  SE: 30-31 #46-#48  <math>I=prt</math>  SE: <i>Extending the Lesson</i> 412 #38-#40.</p>
<p>f. addition property of equality.</p>	<p>SE: 345, 346, 347 TWE: 345, 346, 347</p>
<p>g. multiplication property of equality, e.g., the total price (P) of a car including tax (T), is \$14,685.33. If the tax is 785.42, what is the sale price of the car (S)? <math>P = S + T</math>  <math>\\$14,685.3 = S + 785.42</math>  <math>\\$14,685.33 - \\$785.42 = S</math>  <math>\\$13,899.91 = S</math></p>	<p>The opportunity to address this objective is available. See the following:  SE: 131 #17, 345 (explanation)  Example shows addition with equality.   Multiplication with Equality also taught in Glencoe <i>Mathematics: Applications And Concepts</i>, Course 2 page 259, 355 Example 3, 356 #20</p>
<p>h. additive inverse property, e.g., I had \$50 to spend. I went to the shopping mall one day and spent \$20 in one store, \$25 at a second store, and then \$5 at the food court. One way to solve might be: <math>\\$50 - (\\$20 + \\$25 + \\$5) = \\$50 - \\$50 = 0</math>. Then explain your reasoning.</p>	<p>The opportunity to address this objective is available. See the following:  SE: 296, 297, 298, 339, 344  TWE: 296, 297, 298, 339, 344</p>

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<p>2. analyzes and evaluates the advantages and disadvantages of using integers, whole numbers, fractions (including mixed numbers), decimals, or the irrational number pi and its rational approximations in solving a given real-world problem (2.4.A1a-c) \$, e.g., in the store everything is 50 % off. When calculating the discount, which representation of 50% would you use and why?</p>	<p>The opportunity to address this objective is available throughout. See, for example:</p> <p>SE: 25, 63, 116, 147, 187, 225, 265, 294, 334, 388, 430, 473</p> <p>TWE: 25, 63, 116, 147, 187, 225, 265, 294, 334, 388, 430, 473</p>
<p><b>Benchmark 3: Estimation</b>  <b>The student uses computational estimation with rational numbers and the irrational number pi in a variety of situations.</b></p>	
<p><b>Sixth Grade Knowledge Base Indicators</b>  The student...</p>	
<p>1. estimates quantities with combinations of rational numbers and/or the irrational number pi using various computational methods including mental math, paper and pencil, concrete objects, and/or appropriate technology (2.4.K1a-c) \$.</p>	<p>SE: 116–117, 223–224, 256–257, 415–416, 468, 472, 477, 510, 592–593</p> <p>TWE: 116–117, 223–224, 256–257, 415–416, 468, 472, 477, 510, 592–593</p>
<p>2. uses various estimation strategies and explains how they were used to estimate rational number quantities or the irrational number pi (2.4.K1a-c) \$</p>	<p>The opportunity to address this objective is available. See the following:</p> <p>SE: 116–117, 223–224, 256–257, 415–416</p> <p>TWE: 116–117, 223–224, 256–257, 415–416</p>
<p>3. recognizes and explains the difference between an exact and an approximate answer (2.4.K1a-c).</p>	<p>SE: 116</p> <p>TWE: 116</p>
<p>4. determines the appropriateness of an estimation strategy used and whether the estimate is greater than (overestimate) or less than (underestimate) the exact answer and its potential impact on the result (2.4.K1a).</p>	<p>The opportunity to address this objective is available. See the following:</p> <p>SE: 116–117, 118, 223–224, 256–257, 415–416, 592–593</p> <p>TWE: 116–117, 118, 223–224, 256–257, 415–416, 592–593</p>
<p><b>Sixth Grade Application Indicators</b>  The student...</p>	
<p>1. adjusts original rational number estimate of a real-world problem based on additional information (a frame of reference) (2.4.A1a) \$, e.g., given a large container of marbles, estimate the quantity of marbles. Then, using a smaller container filled with marbles, count the number of marbles in the smaller container and adjust your original estimate.</p>	<p>The opportunity to address this objective is available. See the following:</p> <p>SE: 116–117, 118–119, 223–224, 225, 256–257, 258, 415–416, 417, 468, 472, 479</p> <p>TWE: 116–117, 118–119, 223–224, 225, 256–257, 258, 415–416, 417, 468, 472, 479</p>

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<p>2. <b>N</b> estimates to check whether or not the result of a real-world problem using rational numbers and/or the irrational number pi is reasonable and makes predictions based on the information (2.4.A1a) \$, e.g., a class of 28 students has a goal of reading 1,000 books during the school year. If each student reads 13 books each month, will the class reach their goal?</p>	<p>The opportunity to address this objective is available. See the following:</p> <p>SE: 116, 416, 477</p> <p>TWE: 116, 416, 477</p>
<p>3. selects a reasonable magnitude from given quantities based on a real-world problem and explains the reasonableness of the selection (2.4.A1a), e.g., length of a classroom in meters – 1–3 meters, 5–8 meters, 10–15 meters.</p>	<p>SE: 468, 477</p> <p>TWE: 468, 477</p>
<p>4. determines if a real-world problem calls for an exact or approximate answer and performs the appropriate computation using various computational methods including mental math, paper and pencil, concrete objects, or appropriate technology (2.4.A1a) \$, e.g., Kathy buys items at the grocery store priced at: \$32.56, \$12.83, \$6.99, 5 for \$12.49 each. She has \$120 with her to pay for the groceries. To decide if she can pay for her items, does she need an exact or an approximate answer?</p>	<p>The opportunity to address this objective is available. See the following:</p> <p>SE: 116</p> <p>TWE: 116</p>
<p><b>Benchmark 4: Computation</b>  <b>The student models, performs, and explains computation with positive rational numbers and integers in a variety of situations.</b></p>	
<p><b>Sixth Grade Knowledge Base Indicators</b>  The student...</p>	
<p>1. computes with efficiency and accuracy using various computational methods including mental math, paper and pencil, concrete objects, and appropriate technology (2.4.K1a).</p>	<p>This objective is addressed throughout. See, for example:</p> <p>SE: 26–27, 77, 113, 137, 179, 207, 237, 275, 307, 379, 409–410, 463</p> <p>TWE: 26–27, 77, 113, 137, 179, 207, 237, 275, 307, 379, 409–410, 463</p>
<p>2. performs and explains these computational procedures:</p>	
<p>a. <b>N</b> divides whole numbers through a 2-digit divisor and a 4-digit dividend and expresses the remainder as a whole number, fraction, or decimal (2.4.K1a-b), e.g., <math>7452 \div 24 = 310 \text{ r } 12</math>, <math>310 \frac{12}{24}</math>, <math>310 \frac{1}{2}</math>, or 310.5.</p>	<p>SE: 152–153, 154–155, 591</p> <p>TWE: 152–153, 154–155, 591</p>
<p>b. <b>N</b> adds and subtracts decimals from millions place through thousandths place (2.4.K1c);</p>	<p>SE: 121–122, 123–124</p> <p>TWE: 121–122, 123–124</p>

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c. <b>N</b> multiplies and divides a four-digit number by a two-digit number using numbers from thousands place through hundredths place (2.4.K1a-b), e.g., $4,350 \div 1.2 = 3,625$ ;	SE: 135–136, 137, 141–142, 143, 145, 146–147, 152–153, 154–155, 590, 591 TWE: 135–136, 137, 141–142, 143, 145, 146–147, 152–153, 154–155, 590, 591
d. <b>N</b> multiplies and divides using numbers from thousands place through thousandths place by 10; 100; 1,000; .1; .01; .001; or single-digit multiples of each (2.4.K1a-c); e.g., $54.2 \div .002$ or $54.3 \times 300$ ;	SE: 136, 591 TWE: 136, 591
e. <b>N</b> adds integers, e.g., $+6 + ^-7 = ^-1$ (2.4.K1a);	SE: 300–301, 302–303 TWE: 300–301, 302–303
f. <b>N</b> adds, subtracts, and multiplies fractions (including mixed numbers) expressing answers in simplest form (2.4.K1c)	SE: 228–229, 230–231, 235–236, 237–238, 240–241, 242–243, 244–245, 246–247, 261–262, 265–266, 267 TWE: 228–229, 230–231, 235–236, 237–238, 240–241, 242–243, 244–245, 246–247, 261–262, 265–266, 267
g. <b>N</b> finds the root of perfect whole number squares (2.4.K1a);	This objective is taught in Glencoe <i>Mathematics: Applications And Concepts, Course 2</i> ©2004. SE: 471 Example 3, 475 Example 1 TWE: DI 471
h. <b>N</b> uses basic order of operations (multiplication and division in order from left to right, then addition and subtraction in order from left to right) with whole numbers;	SE: 24–25, 26, 355–356, 357 TWE: 24–25, 26, 355–356, 357
i. adds, subtracts multiplies, and divides rational numbers using concrete objects.	SE: 10, 76, 80, 121, 134, 139–140, 144, 150–151, 223, 228, 244, 259–260, 265, 270–271, 300, 304, 310, 340, 344, 350, 404 TWE: 10, 76, 80, 121, 134, 139–140, 144, 150–151, 223, 228, 244, 259–260, 265, 270–271, 300, 304, 310, 340, 344, 350, 404
3. recognizes, describes, and uses different representations to express the same computational procedures, e.g., $3/4 = 3 \div 4$ .	SE: 19, 20–21, 28–29 TWE: 19, 20–21, 28–29
4. identifies, explains, and finds the prime factorization of whole numbers (2.4.K1d).	SE: 15, 16–17 TWE: 15, 16–17

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5. finds prime factors, greatest common factor, multiples, and the least common multiple (2.4.K1d).	SE: 15, 16–17, 177–178, 179, 194–195, 196–197 TWE: 15, 16–17, 177–178, 179, 194–195, 196–197
6. finds a whole number percent (between 0 and 100) of a whole number (2.4.K1a,c) \$, e.g., 12% of 40 is what number?	SE: 407–408, 409–410, 411–412 TWE: 407–408, 409–410, 411–412
<b>Sixth Grade Application Indicators</b> The student...	
1. generates and/or solves one- and two-step real-world problems with rational numbers using these computational procedures \$:	
a. division with whole numbers (2.4.A1b), e.g., the perimeter of a square is 128 feet. What is the length of its side?	SE: 591 TWE: 591
b. addition, subtraction, multiplication, and division of decimals through hundredths place (A2.4.A1a-c), e.g., it is 25.8 miles from Allen to Barber, 15.2 miles from Barber to Chase, and 14.9 miles from Chase to Douglas. What is the halfway point between Allen and Douglas?	SE: 121–122, 123–124, 135–136, 137–138, 141–142, 143, 145, 146–147, 153, 154–155 TWE: 121–122, 123–124, 135–136, 137–138, 141–142, 143, 145, 146–147, 153, 154–155
c. addition, subtraction, and multiplication of fractions (including mixed numbers) (2.4.A1c), e.g., the student council is having a contest between classes. On the average, each student takes 3 $\frac{1}{3}$ minutes for the relay. How much time is needed for a class of 24 to run the relay?	SE: 229, 230–231, 236, 238, 241, 242–243, 244–245, 246–247, 263–264, 265–266, 267, 272–273, 274–275, 276–277, 278–279 TWE: 229, 230–231, 236, 238, 241, 242–243, 244–245, 246–247, 263–264, 265–266, 267, 272–273, 274–275, 276–277, 278–279
<b>Standard 2: Algebra</b> The student uses algebraic concepts and procedures in a variety of situations.	
<b>Benchmark 1: Patterns</b> The student recognizes, describes, extends, develops, and explains the general rule of a pattern in variety of situations.	
<b>Sixth Grade Knowledge Base Indicators</b> The student...	
1. identifies, states, and continues a pattern presented in various formats including numeric (list or table), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes include:	
a. counting numbers including perfect squares, and factors and multiples (number theory) (2.4.K1a);	SE: 282–283, 284 TWE: 282–283, 284

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b. positive rational numbers limited to two operations (addition, subtraction, multiplication, division) including arithmetic sequences (a sequence of numbers in which the difference of two consecutive numbers is the same) (2.4.K1a);	SE: 282–283, 284 TWE: 282–283, 284
c. geometric figures through two attribute changes (2.4.K1g);	SE: 27, 281 TWE: 27, 281
d. measurements (2.4.K1a);	The opportunity to address this objective is available. See the following:  SE: 284 TWE: 284
e. things related to daily life (2.4.K1a) \$, e.g., time (a full moon every 28 days), tide, calendar, traffic, or appropriate topics across the curriculum.	SE: 20 #17 & #18, 31 #49–#50, 89 #11, 154 #37, 215 #9, 512 #20 <i>WebQuest</i> 3, 97 <i>Real-life Careers</i> 220, 311, 547 TWE: DI 29, 236
2. generates a pattern repeating, growing) (2.4.K1a).	The opportunity to address this objective is available. See the following:  SE: 282–283, 284 TWE: 282–283, 284
3. extends a pattern when given a rule of one or two simultaneous operational changes (addition, subtraction, multiplication, division) between consecutive terms (2.4.K1a), e.g., find the next three numbers in a pattern that starts with 3, where you double and add 1 to get the next number; the next three numbers are 7, 15, and 31.	SE: 282–283, 284 TWE: 282–283, 284
4. states the rule to find the next number of a pattern with one operational change (addition, subtraction, multiplication, division) to move between consecutive terms (2.4.K1a), e.g., given 4, 8, and 16, double the number to get the next term, multiply the term by 2 to get the next term, or add the number to itself for the next term.	SE: 283, 284 TWE: 283, 284

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<b>Sixth Grade Application Indicators</b> The student...													
1. recognizes the same general pattern presented in different representations [numeric (list or table), visual (picture, table, or graph), and written] (2.4.A1a,k), e.g., you are selling cookies by the box. Each box costs \$3. You have \$2 t begin your sales. This can be written as a pattern that begins with 2 and adds three each time, as a table, or graph. <div style="text-align: center;"> <table border="0"> <tr> <td><b>X</b></td> <td><b>Y</b></td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>2</td> <td>5</td> </tr> <tr> <td>3</td> <td>8</td> </tr> <tr> <td>4</td> <td>11</td> </tr> <tr> <td>5</td> <td>14</td> </tr> </table> </div>	<b>X</b>	<b>Y</b>	1	2	2	5	3	8	4	11	5	14	SE: 47 #25, 171 #9, 289 #16 <i>Extending the Lesson</i> 185 <i>Problem-Solving Strategies</i> 33 #9, 281 #11 TWE: A 281 B 280 PS 45
<b>X</b>	<b>Y</b>												
1	2												
2	5												
3	8												
4	11												
5	14												
2. recognizes multiple representations of the same pattern (2.4.A1a) \$, e.g., 1, 10; 100; 1,000; 10,000...													
a. represented as 1; 10; 10 x 10; 10 x 10 x 10; 10 x 10 x 10 x 10; ...;	These pages could be used as a pattern to explain place value. SE: 202-203												
b. represented as $10^0$ ; $10^1$ ; $10^2$ ; $10^3$ ; $10^4$ ; ...;	SE: 20 #17-#18, 136 <i>Example 5</i> TWE: A 138 ICE 136 #5												
c. represented as a unit; a rod; a flat; a cube; ... using base ten blocks; or	SE: 281, 284 TWE: 281, 284												
d. represented as a \$1 bill; a \$10 bill; a \$100 bill ; a \$1,000 bill; ....	This objective dealing with money can be met when using the pattern found in 2a above.												
<b>Benchmark 2: Variables, Equations, and Inequalities</b> <b>The student uses variables, symbols, positive rational numbers, and algebraic expressions in one variable to solve linear equations and inequalities in a variety of situations.</b>													
<b>Sixth Grade Knowledge Base Indicators</b> The student...													
1. explains and uses variables and/or symbols to represent unknown quantities and variable relationships (2.4.K1a), e.g., $x < 2$ .	SE: 28–29, 30–31 TWE: 28–29, 30–31												
2. uses equivalent representations for the same simple algebraic expression with understood coefficients of 1 (2.4.K1a), e.g., when students are developing their own formula for the perimeter of a square they combine $s + s + s + s$ to make $4s$ .	SE: 29, 136, 266, 276–277 TWE: 29, 136, 266, 276–277												

CONTENT STANDARDS	PAGE REFERENCES
3. solves (2.4.K1a,e) \$:	
a. one-step linear equations (addition, subtraction, multiplication, division) with one variable and whole number solutions, e.g., $2x = 8$ or $x + 7 = 12$	SE: 34–35, 36–37, 337–338, 339–340, 341–342, 343, 344–345, 346–347, 350–351, 352–353 TWE: 34–35, 36–37, 337–338, 339–340, 341–342, 343, 344–345, 346–347, 350–351, 352–353
b. one-step linear inequalities (addition, subtraction) in one variable with whole numbers, e.g., $x - 5 < 12$ or $x < 17$ ;	SE: 37, 354 TWE: 37, 354
4. explains and uses equality and inequality symbols ( $=$ , $\neq$ , $<$ , $\leq$ , $>$ , $\geq$ ) and corresponding meanings (is equal to, is not equal to, is less than, is less than or equal to, is greater than, is greater than or equal to) to represent mathematical relationships with positive rational numbers (2.4.K1a-b) \$.	SE: 34, 37, 108–109, 110, 198–199, 200, 295, 296–297, 406, 588 TWE: 34, 37, 108–109, 110, 198–199, 200, 295, 296–297, 406, 588
5. knows and uses the relationship between ratios, proportions, and percents and finds the missing term in simple proportions where the missing term is a whole number (2.4.K1a,c) e.g., $1/2 = x/4$ , $2/3 = 4/x$ , $1/4 = x/100$ .	SE: 380–381, 382–383, 386–387, 388–389, 395–396, 397 TWE: 380–381, 382–383, 386–387, 388–389, 395–396, 397
6. finds the value of algebraic expressions using whole numbers (2.4.Ka), e.g., If $x = 3$ , then $5x = 5(3) = 15$ .	SE: 24–25, 26–27, 28–29, 30–31 TWE: 24–25, 26–27, 28–29, 30–31
<b>Sixth Grade Application Indicators</b> The student...	
1. represents real-world problems using variables and symbols to (2.4.A1a,e) \$:	
a. write algebraic or numerical expressions or one-step equations (addition, subtraction, multiplication, division) with whole number solutions, e.g., John has three times as much money as his sister. If $M$ is the amount of money his sister has, what is the expression that represents the amount of money that John has? The expression would be written as $3M$ .	SE: 24–25, 26–27, 30–31, 35, 36–37, 341, 344, 345, 346, 350, 352, 355, 356–357 TWE: 24–25, 26–27, 30–31, 35, 36–37, 341, 344, 345, 346, 350, 352, 355, 356–357
b. write and/or solve one-step equations (addition, subtraction, multiplication, and division), e.g., a player scored three more points today than yesterday. Today, the player scored 17 points. How many points were scored yesterday? Write an equation to represent this problem. The equation would be written as $y + 3 = 17$ . The answer is $y = 14$ .	SE: 35, 36–37, 339, 341–342, 344–345, 346–347, 350–351, 352 TWE: 35, 36–37, 339, 341–342, 344–345, 346–347, 350–351, 352

CONTENT STANDARDS	PAGE REFERENCES
2. generates real-world problems that represent simple expressions or one-step linear equations (addition, subtraction, multiplication, division) with whole number solutions (2.2.A1a,e), \$ e.g., write a problem situation that represents the expression $x + 10$ . The problem could be: How old will a person be ten years from now?	SE: 24–25, 26–27, 30–31, 35, 36–37, 341, 344, 345, 346, 350, 352, 355, 356–357 TWE: 24–25, 26–27, 30–31, 35, 36–37, 341, 344, 345, 346, 350, 352, 355, 356–357
3. explains the mathematical reasoning that was used to solve a real-world problem using a one-step equation (addition, subtraction, multiplication, division) (2.2.A1a,e) \$, e.g., use the equation form $y + 3 = 17$ . Solve by subtracting 3 from both sides to get $y = 14$ .	SE: 24, 26, 350 TWE: 24, 26, 350
<b>Benchmark 3: Functions</b> <b>The student recognizes, describes, and analyzes linear relationships in a variety of situations.</b>	
<b>Sixth Grade Knowledge Base Indicators</b> The student...	
1. recognizes linear relationships using various methods including mental math, paper and pencil, concrete objects, and graphing utilities or appropriate technology (2.4.K1a).	The opportunity to address this objective is available. See the following: SE: 323, 367, 368–369 TWE: 323, 367, 368–369
2. finds the values and determines the rule with one operation using a function table (input/output machine, T-table) (2.4.K1f).	SE: 362–363, 364–365 TWE: 362–363, 364–365
3. generalizes numerical patterns up to two operations by stating the rule using words (2.4.K1a), e.g., If the sequence is 2400, 1200, 600, 300, 150, ..., what is the rule? In words, the rule could be split the number in half or divide the number before by 2.	SE: 282–283, 284 TWE: 282–283, 284
4. uses a given function table (input/output machine, T-table) to identify, plot, and label the ordered pairs using the four quadrants of a coordinate plane (2.4.K1a,f).	SE: 322, 362–363, 366–367, 368–369 TWE: 322, 362–363, 366–367, 368–369

CONTENT STANDARDS	PAGE REFERENCES																
<b>Sixth Grade Application Indicators</b> The student...																	
1. represents a variety of mathematical relationships using written and oral descriptions of the rule, tables, graphs, and when possible, symbolic notation (2.4.A1f,k) \$, e.g., linear patterns and graphs can be used to represent time and distance situations. Pretend you are in a car traveling from home at 50 miles per hour. Then, represent the $n^{\text{th}}$ term. 50N meaning 50 times the number of hours traveling equals the distance away from home.  <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Time</th> <th style="text-align: center;">Distance</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">1</td><td style="text-align: center;">50</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">100</td></tr> <tr><td style="text-align: center;">.</td><td style="text-align: center;">.</td></tr> <tr><td style="text-align: center;">.</td><td style="text-align: center;">.</td></tr> <tr><td style="text-align: center;">.</td><td style="text-align: center;">.</td></tr> <tr><td style="text-align: center;">n</td><td style="text-align: center;">50n</td></tr> </tbody> </table>	Time	Distance	0	0	1	50	2	100	.	.	.	.	.	.	n	50n	SE: 34, 108, 162, 362–363, 364–365, 366–367, 368–369, 515  TWE: 34, 108, 162, 362–363, 364–365, 366–367, 368–369, 515
Time	Distance																
0	0																
1	50																
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2. interprets and describes the mathematical relationships of numerical, tabular, and graphical representations (2.4.A1f,k).	SE: 362–363, 364–365, 366–367, 368–369  TWE: 362–363, 364–365, 366–367, 368–369																
<b>Benchmark 4: Models</b> <b>The student generates and uses mathematical models to represent and justify mathematical relationships in a variety of situations.</b>																	
<b>Sixth Grade Knowledge Base Indicators</b> The student...																	
1. knows, explains, and uses mathematical models to represent mathematical concepts, procedures, and relationships. Mathematical models include:																	
a. process models (concrete objects, pictures, diagrams, number lines, hundred charts, measurement tools, multiplication arrays, division sets, or coordinate planes/grids) to model computational procedures and mathematical relationships and to solve equations (1.1.K1–5, 1.2.K1, 1.3.K1–4, 1.4.K1, 1.4.K2a, 1.4.K2c-e, 1.4.K2g, 1.4.K2i, 1.4.K6, 2.1.K1a-b, 2.1.K1d-e, 2.1.K2–4, 2.2.K1–6, 2.3.K1, 2.3.K3–4, 3.2.K1–4, 3.2.K8, 3.3.K1–4, 3.4.K1–3, 4.2.K4) \$;	This objective is addressed throughout. See, for example:  SE: 34, 76, 100–101, 134, 181, 228, 259–260, 299, 337, 384–385, 407, 432, 470, 510, 550, 574  TWE: 34, 76, 100–101, 134, 181, 228, 259–260, 299, 337, 384–385, 407, 432, 470, 510, 550, 574																

CONTENT STANDARDS	PAGE REFERENCES
b. place value models (place value mats, hundred charts, base ten blocks, or unifix cubes) to compare, order, and represent numerical quantities and to model computational procedures (1.1.K1–4, 1.2.K1, 1.3.K1–3, 1.4.K2b, 1.4.K2c-d, 2.2K4) \$;	SE: 102 TWE: 102
c. fraction and mixed number models (fraction strips or pattern blocks and decimal and money models (base ten blocks or coins to compare, order, and represent numerical quantities (1.1.K1–4, 1.2.K1, 1.3.K1–3, 1.4.K2b, 1.4.K2d, 1.4.K2f, 1.4.K6, 2.2.K5, 4.1.K4, 4.2.K4) \$;	SE: 181, 218, 234, 259, 270–271 TWE: 181, 218, 234, 259, 270–271
d. factor trees to find least common multiple and greatest common factor (1.4.K4–5);	SE: 15 TWE: 15
e. equations and inequalities to model numerical relationships (2.2.K3,) \$;	SE: 34–35, 37, 337–338, 339–340, 343, 344–345, 350–351, 354, 355–356 TWE: 34–35, 37, 337–338, 339–340, 343, 344–345, 350–351, 354, 355–356
f. function tables (input/output machines, T-tables) to model numerical and algebraic relationships (2.3.K2, 2.3.K4) \$;	SE: 322, 362–363, 364–365, 366–367 TWE: 322, 362–363, 364–365, 366–367
g. two-dimensional geometric models (geoboards or dot paper) to model perimeter, area, and properties of geometric shapes and three-dimensional geometric models (nets or solids) and real-world objects to model volume and to identify attributes (faces, edges, vertices, bases) of geometric shapes (2.1.K1c, 3.1.K1–5, 3.1.K7–10, 3.2.K7, 3.3.K1–4);	SE: 39, 158, 464, 522, 532–533, 546, 550, 555, 556, 570, 575 TWE: 39, 158, 464, 522, 532–533, 546, 550, 555, 556, 570, 575
h. tree diagrams to organize attributes and determine the number of possible combinations (4.1.K2);	SE: 433–434, 435–436 TWE: 433–434, 435–436
i. graphs using concrete objects, two- and three-dimensional geometric models (spinners or number cubes) and process models (concrete objects, pictures, diagrams, or coins) to model probability (4.1.K1–4) \$.	SE: 426–427, 432, 444, 450–451 TWE: 426–427, 432, 444, 450–451

CONTENT STANDARDS	PAGE REFERENCES
j. frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, line plots, charts, tables, single stem-and-leaf plots, and scatter plots to organize and display data (4.2.K1–3) \$;	SE: 50–51, 52–53, 56–57, 58–59, 62–63, 64–65, 72–73, 74–75, 176, 177  TWE: 50–51, 52–53, 56–57, 58–59, 62–63, 64–65, 72–73, 74–75, 176, 177
k. Venn diagrams to sort data and to show the relationships (1.2.K1).	SE: 176, 177  TWE: 176, 177
2. uses one or more mathematical models to show the relationship between two or more things.	SE: 50–51, 56–57, 62–63, 72–73, 176, 177, 432, 464, 522  TWE: 50–51, 56–57, 62–63, 72–73, 176, 177, 432, 464, 522
<b>Sixth Grade Application Indicators</b> The student...	
1. recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include:	
a. process models (concrete objects, pictures, diagrams, number lines, hundred charts, measurement tools, multiplication arrays, division sets, or coordinate planes/grids) to model computational procedures and mathematical relationships, to represent problem situations, and to solve equations (1.1.A1, 1.1.A1a, 1.2.A1–2, 1.3.A1–4, 1.4.A1a-b, 2.1.A1–2, 2.1.A1–3, 3.2.A1a, 3.2.A1c, 3.2.A2, 3.3.A1–2, 3.4.A1–2, 4.2.A1) \$;	This objective is addressed throughout. See, for example:  SE: 34, 76, 100–101, 134, 181, 228, 259–260, 299, 337, 384–385, 407, 432, 470, 510, 550, 574  TWE: 34, 76, 100–101, 134, 181, 228, 259–260, 299, 337, 384–385, 407, 432, 470, 510, 550, 574
b. place value models (place value mats, hundred charts, base ten blocks, or unifix cubes) to model problem situations (1.1.A1, 1.2.A1–2, 2.2.A3) \$;	SE: 102  TWE: 102
c. fraction and mixed number models (fraction strips or pattern blocks) and decimal and money models (base ten blocks or coins) to compare, order, and represent numerical quantities (1.1.A1, 1.1.A2b-c, 1.2.A1–2, 1.4.A1b-c) \$;	SE: 181, 218, 234, 259, 270–271  TWE: 181, 218, 234, 259, 270–271
d. factor trees to find least common multiple and greatest common factor;	SE: 15  TWE: 15

CONTENT STANDARDS	PAGE REFERENCES
e. equations and inequalities to model numerical relationships (2.2.A1–3) §;	SE: 34–35, 37, 337–338, 339–340, 343, 344–345, 350–351, 354, 355–356 TWE: 34–35, 37, 337–338, 339–340, 343, 344–345, 350–351, 354, 355–356
f. function tables (input/output machines, T-tables) to model numerical and algebraic relationships (2.3.A1–2) §;	SE: 322, 362–363, 364–365, 366–367 TWE: 322, 362–363, 364–365, 366–367
g. two-dimensional geometric models (geoboards or dot paper) to model perimeter, area, and properties of geometric shapes and three-dimensional geometric models (nets or solids) and real-world objects to model volume and to identify attributes (faces, edges, vertices, bases) of geometric shapes (3.1.A1–3.3.2.A1b, 3.4.A2);	SE: 158, 464, 522, 532–533, 564, 550, 555, 556, 570, 575 TWE: 158, 464, 522, 532–533, 564, 550, 555, 556, 570, 575
h. scale drawings to model large and small real-world objects (3.4.A2);	SE: 391–392, 393, 394 TWE: 391–392, 393, 394
i. tree diagrams to organize attributes and determine the number of possible combinations;	SE: 433–434, 435–436 TWE: 433–434, 435–436
j. two- and three-dimensional geometric models (spinners or number cubes) and process models (concrete objects, pictures, diagrams, or coins) to model probability (4.1.A1–3) §;	SE: 426–427, 432, 444, 450–451 TWE: 426–427, 432, 444, 450–451
k. graphs using concrete objects, frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, line plots, charts, tables, and single stem-and-leaf plots to organize, display, explain, and interpret data (2.1.A1, 2.3.A1–2, 4.1.A1–2, 4.2.A1–3) §;	SE: 50–51, 52–53, 56–57, 58–59, 62–63, 64–65, 72–73, 74–75, 176, 177 TWE: 50–51, 52–53, 56–57, 58–59, 62–63, 64–65, 72–73, 74–75, 176, 177
l. Venn diagrams to sort data and to show relationships.	SE: 176, 177 TWE: 176, 177

CONTENT STANDARDS	PAGE REFERENCES
2. selects a mathematical model and justifies why some mathematical models are more accurate than other mathematical models in certain situations. (For purposes of assessment, the focus will be on graphs using concrete objects, frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, charts, tables, and single stem-and-leaf plots.)	SE: 56, 59, 62 TWE: 56, 59, 62
<b>Standard 3: Geometry</b> <b>The student uses geometric concepts and procedures in a variety of situations.</b>	
<b>Benchmark 1: Geometric Figures and Their Properties</b> <b>The student recognizes geometric figures and compares their properties in a variety of situations.</b>	
<b>Sixth Grade Knowledge Base Indicators</b> The student...	
1. recognizes and compares properties of plane figures and solids using concrete objects, constructions, drawings, and appropriate technology (2.4.K1g).	SE: 522–523, 524–525, 532–533, 534–535, 536, 564–565, 566, 567 TWE: 522–523, 524–525, 532–533, 534–535, 536, 564–565, 566, 567
2. recognizes and names regular and irregular polygons through 10 sides including all special types of quadrilaterals: squares, rectangles, parallelograms, rhombi, trapezoids, kites (2.4.K1g).	SE: 522–523 TWE: 522–523
3. names and describes the solids [prisms (rectangular and triangular), cylinders, cones, spheres, and pyramids (rectangular and triangular)] using the terms faces, edges, vertices, and bases (2.4.K1g).	SE: 564–565, 566 TWE: 564–565, 566
4. recognizes all existing lines of symmetry in two-dimensional figures (2.4.K1g).	SE: 528–529, 530–531 TWE: 528–529, 530–531
5. recognizes and describes the attributes of similar and congruent figures (2.4.K1g).	SE: 534–535, 536 TWE: 534–535, 536
6. recognizes and uses symbols for angle (find symbol for), line ( $\_$ ), line segment ( $\_$ ), ray ( $\_$ ), parallel ( $\parallel$ ), and perpendicular ( $\perp$ ).	SE: 506, 514, 515 TWE: 506, 514, 515

CONTENT STANDARDS	PAGE REFERENCES
7. classifies (2.4.K1g):	
a. angles as right, obtuse, acute, or straight;	SE: 506 TWE: 506
b. triangles as right, obtuse, acute, scalene, isosceles, or equilateral.	SE: 523, 526–527 TWE: 523, 526–527
8. identifies and defines circumference, radius, and diameter of circles and semicircles.	SE: 161–162, 163–164 TWE: 161–162, 163–164
9. recognize that the sum of the angles of a triangle equals $180^\circ$ (2.4.K1g).	SE: 526 TWE: 526
10. determines the radius or diameter of a circle given one or the other.	SE: 161–162, 163–164 TWE: 161–162, 163–164
<b>Sixth Grade Application Indicators</b>	
The student...	
1. solves real-world problems by applying the properties of (2.4.A1g):	
a. plane figures (regular polygons through 10 sides, circles, and semicircles) and the line(s) of symmetry, e.g., twins are having a birthday party. The rectangular birthday cake is to be cut into two equal sizes of the same shape. How would you cut the cake?	The opportunity to address this objective is available. See the following: SE: 528–529, 530–531 TWE: 528–529, 530–531
b. solids (cubes, rectangular prisms, cylinders, cones, spheres, triangular prisms) emphasizing faces, edges, vertices, and bases, e.g., lace is to be glued on all of the edges of a cube. If one edge measures 34 cm, how much lace is needed?	SE: 566, 571, 572–573, 576–577 TWE: 566, 571, 572–573, 576–577
c. intersecting, parallel, and perpendicular lines, e.g., railroad tracks form what type of lines? Two roads are perpendicular, what is the angle between them?	The opportunity to address this objective is available. See the following: SE: 515, 523 TWE: 515, 523

CONTENT STANDARDS	PAGE REFERENCES
2. decomposes geometric figures made from (2.4.A1g):	
a. regular and irregular polygons through 10 sides, circles, and semicircles, e.g., draw a picture of a house (rectangular base) with a roof (triangle) and a chimney on the side of the roof (trapezoid). Identify the three geometrical figures.	The opportunity to address this objective is available. See the following:  SE: 522–523, 524–525  TWE: 522–523, 524–525
b. nets (two-dimensional shapes that can be folded into three-dimensional figures), e.g., the cardboard net that becomes a shoebox.	SE: 574, 576, 578  TWE: 574, 576, 578
3. composes geometric figures made from (2.4.A1g):	
a. regular and irregular polygons through 10 sides, circles, and semicircles;	The opportunity to address this objective is available. See the following:  SE: 522–523, 524–525  TWE: 522–523, 524–525
b. nets (two-dimensional shapes that can be folded into three-dimensional figures).	SE: 574, 575  TWE: 574, 575
<b>Benchmark 2: Measurement and Estimation</b>	
<b>The student estimates, measures, and uses measurement formulas in a variety of situations.</b>	
<b>Sixth Grade Knowledge Base Indicators</b>	
The student...	
1. determines and uses whole number approximations (estimations) for length, width, weight, volume, temperature, time, perimeter, and area using standard and nonstandard units of measure (2.4.K1a) \$.	SE: 468, 472, 477, 510  TWE: 468, 472, 477, 510
2. selects, explains the selection of, and uses measurement tools, units of measure, and level of precision appropriate for a given situation to find accurate rational number representations for length, weight, volume, temperature, time, perimeter, area, and angle measurements (2.4.K1a) \$.	SE: 465–466, 467–468, 470–471, 476–477, 478–479, 480–481, 484–486, 487  TWE: 465–466, 467–468, 470–471, 476–477, 478–479, 480–481, 484–486, 487

CONTENT STANDARDS	PAGE REFERENCES
3. converts (2.4.K1a):	
a. within the customary system, e.g., converting feet to inches, inches to feet, gallons to pints, pints to gallons, ounces to pounds, or pounds to ounces;	SE: 465–466, 470–471 TWE: 465–466, 470–471
b. within the metric system using the prefixes: kilo, hecto, deka, deci, centi, and milli; e.g., converting millimeters to meters, meters to millimeters, liters to kiloliters, kiloliters to liters, milligrams to grams, or grams to milligrams.	SE: 477, 490 TWE: 477, 490
4. uses customary units of measure to the nearest sixteenth of an inch and metric units of measure to the nearest millimeter (2.4.K1a).	SE: 465–466, 476–477 TWE: 465–466, 476–477
5. recognizes and states perimeter and area formulas for squares, rectangles, and triangles (2.4.K1g).	
a. uses given measurement formulas to find perimeter and area of: squares and rectangles,	SE: 39–41, 158–160 TWE: 39–41, 158–160
b. figures derived from squares and/or rectangles.	The opportunity to address this objective is available. See the following:  SE: 39–41, 158–160 TWE: 39–41, 158–160
6. describes the composition of the metric system (2.4.K1a):	
a. meter, liter, and gram (root measures);	SE: 476, 484, 485 TWE: 476, 484, 485
b. kilo, hecto, deka, deci, centi, and milli (prefixes).	The opportunity to address this objective is available. See the following:  SE: 476, 484–485 TWE: 476, 484–485
7. finds the volume of rectangular prisms using concrete objects (2.4.K1g).	SE: 570–571, 572–573 TWE: 570–571, 572–573
8. estimates an approximate value of the irrational number pi (2.4.K1a).	SE: 162, 556 TWE: 162, 566

CONTENT STANDARDS	PAGE REFERENCES
<b>Sixth Grade Application Indicators</b>	
The student...	
1. solves real-world problems by applying these measurement formulas \$:	
a. perimeter of polygons using the same unit of measurement (2.4.A1a,g), e.g., measures the length of the fence around a yard;	SE: 159, 160 TWE: 159, 160
b. area of squares, rectangles, and triangles using the same unit of measurement (2.4.A1g), e.g., finds the area of a room for carpeting;	SE: 40–41, 469, 547, 549, 553–554 TWE: 40–41, 469, 547, 549, 553–554
c. conversions within the metric system (2.4.A1a), e.g., your school is having a balloon launch. Each student needs 40 centimeters of string, and there are 42 students. How many meters of string are needed?	SE: 491, 492 TWE: 491, 492
2. estimates to check whether or not measurements and calculations for length, width, weight, volume, temperature, time, perimeter, and area in real-world problems are reasonable and adjusts original measurement or estimation based on additional information (a frame of reference) (2.4.A1a) \$, e.g., students estimate, in feet, the height of a bookcase in their classroom. Then a student who is about 5 feet tall stands beside it. The students then adjust their estimate.	SE: 468, 472, 477 TWE: 468, 472, 477
<b>Benchmark 3: Transformational Geometry</b>	
<b>The student recognizes and performs transformations on two- and three-dimensional geometric figures in a variety of situations.</b>	
<b>Sixth Grade Knowledge Base Indicators</b>	
The student...	
1. identifies, describes, and performs one or two transformations (reflection, rotation, translation) on a two-dimensional figure (2.4.K1a).	SE: 532–533 TWE: 532–533
2. reduces (contracts/shrinks) and enlarges (magnifies/grows) simple shapes with simple scale factors (2.4.K1a), e.g., tripling or halving.	SE: 394 TWE: 394
3. recognizes three-dimensional figures from various perspectives (top, bottom, sides, corners) (2.4.K1a).	SE: 564–565, 566 TWE: 564–565, 566
4. recognizes which figures will tessellate (2.4.K1a).	SE: 537 TWE: 537

CONTENT STANDARDS	PAGE REFERENCES
<b>Sixth Grade Application Indicators</b> The student...	
1. describes a transformation of a given two-dimensional figure that moves it from its initial placement (preimage) to its final placement (image) (2.4.A1a).	SE: 532–533 TWE: 532–533
2. makes a scale drawing of a two-dimensional figure using a simple scale (2.4.A1a), e.g., using the scale 1 cm = 30 m, the student makes a scale drawing of the school.	SE: 394 TWE: 394
<b>Benchmark 4: Geometry From An Algebraic Perspective</b> <b>The student relates geometric concepts to a number line and a coordinate plane in a variety of situations.</b>	
<b>Sixth Grade Knowledge Base Indicators</b> The student...	
1. uses a number line (horizontal/vertical) to order integers and positive rational numbers (in both fractional and decimal form) (2.4.K1a).	SE: 108, 186, 295, 406, 588 TWE: 108, 186, 295, 406, 588
2. organizes integer data using a T-table and plots the ordered pairs in all four quadrants of a coordinate plane (coordinate grid) (2.4.K1a).	SE: 320–322, 323, 362–363, 364–365, 366–367, 368–369 TWE: 320–322, 323, 362–363, 364–365, 366–367, 368–369
3. uses all four quadrants of the coordinate plane to (2.4.K1a):	
a. identify the ordered pairs of integer values on a given graph;	SE: 320–321, 322–323 TWE: 320–321, 322–323
b. plot the ordered pairs of integer values.	SE: 320–322, 323, 366 TWE: 320–322, 323, 366
<b>Sixth Grade Application Indicators</b> The student...	
1. represents, generates, and/or solves real-world problems using a number line with integer values (2.4.A1a) \$, e.g., the difference between $-2$ degrees and 10 degrees on a thermometer is 12 degrees (units); similarly, the distance between $-2$ to $+10$ on a number line is 12 units.	SE: 108, 295 TWE: 108, 295

CONTENT STANDARDS	PAGE REFERENCES
2. represents and/or generates real-world problems using a coordinate plane with integer values to find (2.4.A1a,g-h):	
a. the perimeter of squares and rectangles, e.g., Alice made a scale drawing of her classroom and put it on a coordinate plane marked off in feet. The rectangular table in the back of the room was described by the points (8,9), (8,12), (14,12) and (14,9). Now Alice wants to put a skirting around the outer edge of the table. Using the drawing, find the amount of skirting she will need.	SE: <i>Hands-on Lab</i> 394 (constructing a scale drawing)
b. the area of triangles, squares, and rectangles, e.g., a scale drawing of a flower garden is found in a book with the coordinates of the four corners being (9,5), (9,13), (18,13) and (18,5). The scale is marked off in meters. How many square meters is the flower garden?	This example can be adapted to meet the objective. SE: 329 #17-#19
<b>Standard 4: Data</b> <b>The student uses concepts and procedures of data analysis in a variety of situations.</b>	
<b>Benchmark 1: Probability</b> <b>The student applies the concepts of probability to draw conclusions and to make predictions and decisions including the use of concrete objects in a variety of situations.</b>	
<b>Sixth Grade Knowledge Base Indicators</b> The student...	
1. recognizes that all probabilities range from zero (impossible) through one (certain) and can be written as a fraction, decimal, or a percent (2.4.K1i) \$ , e.g., when you flip a coin, the probability of the coin landing on heads (or tails) is 1/2, .5, or 50%.	SE: 426–427, 428–429, 430–431, 432, 434, 435–436  TWE: 426–427, 428–429, 430–431, 432, 434, 435–436
2. lists all possible outcomes of an experiment or simulation with a compound event composed of two independent events in a clear and organized way (2.4.K1h-j), e.g., using a tree diagram or list to find all the possible color combinations of pant and shirt ensembles, if there are 3 shirts (red, green, blue) and 2 pairs of pants (black and brown).	SE: 432, 433–434, 435–436  TWE: 432, 433–434, 435–436
3. recognizes whether an outcome in a compound event in an experiment or simulation is impossible, certain, likely, unlikely, or equally likely (2.4.K1i).	The opportunity to address this objective is available. See the following:  SE: 428–429  TWE: 428–429
4. represents the probability of a simple event in an experiment or simulation using fractions and decimals (2.4.K1c,i), e.g., the probability of rolling an even number on a single number cube is represented by 1/2 or .5.	SE: 428–429, 430–431  TWE: 428–429, 430–431

CONTENT STANDARDS	PAGE REFERENCES
<b>Sixth Grade Application Indicators</b> The student...	
1. conducts an experiment or simulation with a compound event composed of two independent events including the use of concrete objects; records the results in a chart, table, or graph; and uses the results to draw conclusions about the events and make predictions about future events (2.4.A1j-k).	The opportunity to address this objective is available. See the following:  SE: 426–427  TWE: 426–427
2. analyzes the results of a given experiment or simulation of a compound event composed of two independent events to draw conclusions and make predictions in a variety of real-world situations (2.4.A1j-k), e.g., given the equal likelihood that a customer will order a pizza with either thick or thin crust, and an equal probability that a single topping of beef, pepperoni, or sausage will be selected – 1) What is the probability that a pizza ordered will be thin crust with beef topping/ 2) Given sales of 30 pizzas on a Friday night, how many would the manager expect to be thin crust with beef topping?	The opportunity to address this objective is available. See the following:  SE: 426–427  TWE: 426–427
3. compares what should happen (theoretical probability/expected results) with what did happen (experimental probability/empirical results) in an experiment or simulation with a compound event composed of two independent events (2.4.A1j).	SE: 426, 428–429  TWE: 426, 428–429
<b>Benchmark 2: Statistics</b> <b>The student collects, organizes, displays, and explains numerical (rational numbers) and non-numerical data sets in a variety of situations with a special emphasis on measures of central tendency.</b>	
<b>Sixth Grade Knowledge Base Indicators</b> The student...	
1. organizes, displays, and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and rational number intervals using these <b>data displays</b> (2.4.K1j) \$:	
a. graphs using concrete objects;	SE: 322  TWE: 322
b. frequency tables and line plots;	SE: 50–51, 52–53, 56–57, 59  TWE: 50–51, 52–53, 56–57, 59
c. bar, line, and circle graphs;	SE: 56–57, 58–59, 62–63, 64–65  TWE: 56–57, 58–59, 62–63, 64–65

CONTENT STANDARDS	PAGE REFERENCES
d. Venn diagrams or other pictorial displays;	SE: 176, 177 TWE: 176, 177
e. charts and tables;	SE: 66 TWE: 66
f. single stem-and-leaf plots;	SE: 72–73, 74–75 TWE: 72–73, 74–75
g. scatter plots;	This objective is taught in Glencoe <i>Pre-Algebra</i> 2003 SE: 39, 40–42, 43, 45–46, 50, 61, 68, 107, 408,
2. selects and justifies the choice of data collection techniques (observations, surveys, or interviews) and sampling techniques (random sampling, samples of convenience, or purposeful sampling) in a given situation (2.4.K1j).	SE: 437, 438–439, 440, 441 TWE: 437, 438–439, 440, 441
3. uses sampling to collect data and describe the results (2.4.K1j) \$.	SE: 438 TWE: 438
4. determines mean, median, mode, and range for (2.4.K1a,c) \$:	
a. a whole number data set,	SE: 76–77, 78, 80–82, 83 TWE: 76–77, 78, 80–82, 83
b. a decimal data set with decimals greater than or equal to zero.	The opportunity to address this objective is available. See the following: SE: 76–77, 78, 80–82, 83 TWE: 76–77, 78, 80–82, 83
<b>Sixth Grade Application Indicators</b> The student...	
1. uses data analysis (mean, median, mode, range) of a whole number data set or a decimal data set with decimals greater than or equal to zero to make reasonable inferences, predictions, and decisions and to develop convincing arguments from these <b>data displays</b> (2.4.A1k) \$:	
a. graphs using concrete objects;	The opportunity to address this objective is available. See the following: SE: 322 TWE: 322

<b>CONTENT STANDARDS</b>	<b>PAGE REFERENCES</b>
b. frequency tables and line plots;	The opportunity to address this objective is available. See the following:  SE: 50–51, 52–53, 56–57, 59  TWE: 50–51, 52–53, 56–57, 59
c. bar, line, and circle graphs;	The opportunity to address this objective is available. See the following:  SE: 56–57, 58–59, 62–63, 64–65  TWE: 56–57, 58–59, 62–63, 64–65
d. Venn diagrams or other pictorial displays;	The opportunity to address this objective is available. See the following:  SE: 176, 177  TWE: 176, 177
e. charts and tables;	The opportunity to address this objective is available. See the following:  SE: 66  TWE: 66
f. single stem-and-leaf plots.	The opportunity to address this objective is available. See the following:  SE: 72–73, 74–75  TWE: 72–73, 74–75
2. explains advantages and disadvantages of various data displays for a given data set (2.4.A1k) \$.	SE: 50, 56, 59, 62, 72–73, 176  TWE: 50, 56, 59, 62, 72–73, 176
3. recognizes and explains the effects of scale and/or interval changes on graphs of whole number data sets (2.4.A1k).	SE: 87  TWE: 87

### Codes Used for TWE Pages

A	Assess
B	Bellringer
DI	Daily Intervention
ICE	In-Class Example
PS	Portfolio Suggestion