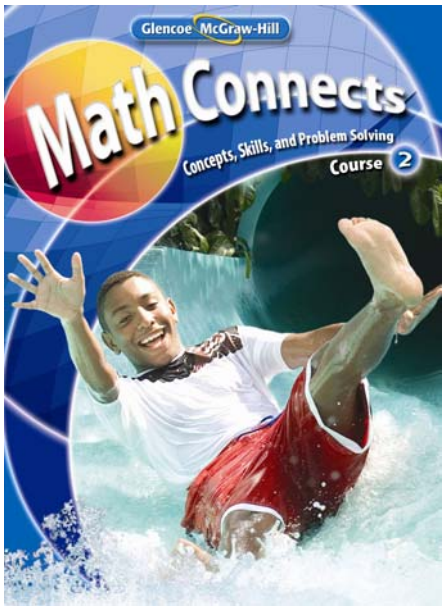
Glencoe

Academic Standards
in Mathematics
Grade 6

Minnesota



Math Connects

Concepts, Skills, and Problem Solving

Course 2

STANDARDS	PAGE REFERENCES
Number & Operation	
Read, write, represent and compare positive rational numbers expressed as fractions, decimals, percents and ratios; write positive integers as products of factors; use these representations in real-world and mathematical situations.	
6.1.1.1 Locate positive rational numbers on a number line and plot pairs of positive rational numbers on a coordinate grid.	**Student Edition:** 80-83, 84-87, 88-92, 120, 121, 672, 705 #4-#8 *Mid-Chapter Quiz* 100 #16-#20 *Practice Test* 123 #9-#11 **Teacher Edition:** A 87; AA 92; AE 81, 89, 90; FMC 89; ODI 84a, 88a
6.1.1.2 Compare positive rational numbers represented in various forms. Use the symbols < and >. *For example*: $\frac{1}{2} > 0.36$.	**Student Edition:** 84-87, 120, 200 #43, 204 #34-#39, 209 #38-#43, 215-220, 224, 671, 679, 707 #18, 740-741 *Mid-Chapter Quiz* 100 *Practice Test* 225 #22-#24 **Teacher Edition:** AA 200; AE 84, 85, 216, 217; TNT 84, 216

Codes used with Teacher Edition pages are found on the last page of the correlation.

STANDARDS	PAGE REFERENCES
6.1.1.3 Understand that percent represents parts out of 100 and ratios to 100. *For example*: 75% is equivalent to the ratio 75 to 100, which is equivalent to the ratio 3 to 4.	**Student Edition:** 202-205, 206-210, 223, 226 #2, 328-332, 678, 684, 707 #9-#13, 720 #2, 732 #1 *Practice Test* 225 **Teacher Edition:** AA 202; AE 203, 330; FMC 203, 207, 329; T 202
6.1.1.4 Determine equivalences among fractions, decimals and percents; select among these representations to solve problems. *For example*: Since $\frac{1}{10}$ is equivalent to 10%, if a woman making $25 an hour gets a 10% raise, she will make an additional $2.50 an hour, because $2.50 is $\frac{1}{10}$ of $25.	**Student Edition:** 196-200, 202-205, 206-210, 223, 224, 328-332, 677, 678, 684, 707 *Mid-Chapter Quiz* 201 *Practice Test* 225 **Teacher Edition:** AE 197, 203, 207; FMC 197, 203, 207; PA 200; T 328; TNT 199
6.1.1.5 Factor whole numbers; express a whole number as a product of prime factors with exponents. *For example*: $24 = 2^3 \times 3$.	**Student Edition:** 30-33, 37 #42-#45, 71, 181-184, 222, 668, 676 *Math Lab* 180 *Mid-Chapter Quiz* 48 #2-#3, 201 #5-#8 *Practice Test* 75 #2-#3 *Reading to Solve Problems* 185 **Teacher Edition:** A 180; AE 31, 182; FMC 182; PA 33; T 181
6.1.1.6 Determine greatest common factors and least common multiples. Use common factors and common multiples to do arithmetic with fractions and find equivalent fractions. *For example*: Factor the numerator and denominator of a fraction to determine an equivalent fraction.	**Student Edition:** 186-189, 192-195, 211-214, 222, 223, 224, 676, 677, 678 *Mid-Chapter Quiz* 201 *Practice Test* 225 *Reading to Solve Problems* 185 **Teacher Edition:** AE 186, 187, 192, 212; F 190; FMC 187, 193; TNT 187, 188, 194
6.1.1.7 Convert between equivalent representations of positive rational numbers. *For example*: Express $\frac{10}{7}$ as $\frac{7+3}{7} = \frac{7}{7} + \frac{3}{7} = 1\frac{3}{7}$.	**Student Edition:** 192-195, 196-200, 202-205, 206-210, 223, 224, 328-332, 336, 677, 678, 684 *Mid-Chapter Quiz* 201 *Practice Test* 225 **Teacher Edition:** AE 193, 197, 198, 203, 329; TNT 199, 209

STANDARDS	PAGE REFERENCES
Understand the concept of ratio and its relationship to fractions and to the multiplication and division of whole numbers. Use ratios to solve real-world and mathematical problems.	
6.1.2.1 Identify and use ratios to compare quantities; understand that comparing quantities using ratios is not the same as comparing quantities using subtraction. *For example*: In a classroom with 15 boys and 10 girls, compare the numbers by subtracting (there are 5 more boys than girls) or by dividing (there are 1.5 times as many boys as girls). The comparison using division may be expressed as a ratio of boys to girls (3 to 2 or 3:2 or 1.5 to 1).	**Student Edition:** 282-286, 320-326, 334, 681, 709 #1-#2, 724 #5 *Mid-Chapter Quiz* 317 #1-#6 *Practice Test* 337 *Spreadsheet Lab* 327 **Teacher Edition:** A 286; AE 283, 322; DI 285; FMC 283; ODI 282a; PA 325
6.1.2.2 Apply the relationship between ratios, equivalent fractions and percents to solve problems in various contexts, including those involving mixtures and concentrations. *For example*: If 5 cups of trail mix contains 2 cups of raisins, the ratio of raisins to trail mix is 2 to 5. This ratio corresponds to the fact that the raisins are $\frac{2}{5}$ of the total, or 40% of the total. And if one trail mix consists of 2 parts peanuts to 3 parts raisins, and another consists of 4 parts peanuts to 8 parts raisins, then the first mixture has a higher concentration of peanuts.	**Student Edition:** 328-332, 336, 350-354, 366, 385, 709 #15-#17, 710 #2, 720 #2, 732 #1 *Practice Test* 337 #17-#20, 389 #9 *Reading to Solve Problems* 349 **Teacher Edition:** AE 329, 330, 352, 366; DI 330; F 349; FMC 329, 351
6.1.2.3 Determine the rate for ratios of quantities with different units. *For example*: 60 miles in 3 hours is equivalent to 20 miles in one hour (20 mph).	**Student Edition:** 287-292, 293-297, 320-326, 334, 336, 682, 709 #3-#4 *Mid-Chapter Quiz* 317 *Practice Test* 337 #3-#6 *Real-World Example* 144 *Spreadsheet Lab* 327 **Teacher Edition:** AE 288, 293, 294, 322; FMC 288; PA 325; TNT 144

STANDARDS	PAGE REFERENCES
6.1.2.4 Use reasoning about multiplication and division to solve ratio and rate problems. *For example*: If 5 items cost $3.75, and all items are the same price, then 1 item costs 75 cents, so 12 items cost $9.00.	**Student Edition:** 287-292, 298-303, 304-309, 320-326, 335, 336, 682, 683, 684, 709 #7-#10 *Mid-Chapter Quiz* 317 *Practice Test* 337 #7-#10 *Spreadsheet Lab* 327 **Teacher Edition:** AE 288, 289, 299, 300, 306, 322; FMC 299; TNT 305
Multiply and divide decimals, fractions and mixed numbers; solve real-world and mathematical problems using arithmetic with positive rational numbers.	
6.1.3.1 Multiply and divide decimals and fractions, using efficient and generalizable procedures, including standard algorithms.	**Student Edition:** 252-257, 265-270, 274, 680, 681, 708 #9, #12, 736, 737, 738 *Math Lab* 250-251 *Practice Test* 275 *Reading to Solve Problems* 264 **Teacher Edition:** A 251; AE 253, 254, 266; DI 250, 269; FMC 253; PA 257
6.1.3.2 Use the meanings of fractions, multiplication, division and the inverse relationship between multiplication and division to make sense of procedures for multiplying and dividing fractions. *For example*: Just as $\frac{12}{4}=3$ means $12=3\times4$, $\frac{2}{3}\div\frac{4}{5}=\frac{5}{6}$ means $\frac{5}{6}\times\frac{4}{5}=\frac{2}{3}$.	**Student Edition:** 252-257, 258-263, 265-270, 274, 680, 681, 708 #9-#12 *Math Lab* 250-251 *Practice Test* 275 *Reading to Solve Problems* 264 **Teacher Edition:** AA 257; AE 253, 254, 259; DI 250; PA 262; RC 265; T 264; TNT 254
6.1.3.3 Calculate the percent of a number and determine what percent one number is of another number to solve problems in various contexts. *For example*: If John has $45 and spends $15, what percent of his money did he keep?	**Student Edition:** 344-348, 350-354, 361-365, 385, 386, 684, 685 *Math Lab* 342-343 *Mid-Chapter Quiz* 368 *Practice Test* 389 *Reading to Solve Problems* 349 **Teacher Edition:** A 343, 348; AE 345, 350, 351, 363; FMC 362; T 349; TNT 342

STANDARDS	PAGE REFERENCES
6.1.3.4 Solve real-world and mathematical problems requiring arithmetic with decimals, fractions and mixed numbers.	**Student Edition:** 30-33, 95-99, 103-106, 107-111, 114-118, 236-241, 242-246, 252-257, 265-270, 736, 737, 738 *Math Lab* 250-251 *Reading to Solve Problems* 264 **Teacher Edition:** AE 116, 237; FMC 31, 108; T 264; TNT 245
6.1.3.5 Estimate solutions to problems with whole numbers, fractions and decimals and use the estimations to assess the reasonableness of computations and of results in the context of the problem. *For example*: The sum $\frac{1}{3}+0.25$ can be estimated to be between $\frac{1}{2}$ and 1, and this estimate can be used as a check on the result of a more detailed calculation.	**Student Edition:** 230-235, 355-360, 365 #39, 366-367, 385, 386, 679, 685, 686, 735 *Mid-Chapter Quiz* 368 #11-#17 *Practice Test* 389 #4-#8 **Teacher Edition:** AA 367; AE 355, 357, 366; DI 366; FMC 266, 356; T 230, 366; TNT 231, 234, 358
Algebra	
Recognize and represent relationships between varying quantities; translate from one representation to another; use patterns, tables, graphs and rules to solve real-world and mathematical problems.	
6.2.1.1 Understand that a variable can be used to represent a quantity that can change, often in relationship to another changing quantity. Use variables in various contexts. *For example*: If a student earns $7 an hour in a job, the amount of money earned can be represented by a variable and is related to the number of hours worked, which also can be represented by a variable.	**Student Edition:** 8-9, 44-47, 49-52, 63-67, 70, 73, 128-133, 669 *Algebra Lab* 62 *Mid-Chapter Quiz* 48 #15-#20 *Practice Test* 75 #9-#16 **Teacher Edition:** A 9; AE 45, 49, 64, 128; DI 50; FMC 45; PA 61
6.2.1.2 Represent the relationship between two varying quantities with function rules, graphs and tables; translate between any two of these representations. *For example*: Describe the terms in the sequence of perfect squares t = 1, 4, 9, 16, ... by using the rule $t=n^2$ for n = 1, 2, 3, 4, ...	**Student Edition:** 63-67, 74, 163-167, 172, 174 #1, 671, 704 #12, 730-731 *Graphing Calculator Lab* 68-69, 168-169 *Practice Test* 75 #24-#25, 173 #25 **Teacher Edition:** A 69; AA 65; AE 63, 165; FMC 64, 164; TNT 66

STANDARDS	PAGE REFERENCES
Use properties of arithmetic to generate equivalent numerical expressions and evaluate expressions involving positive rational numbers	
6.2.2.1 Apply the associative, commutative and distributive properties and order of operations to generate equivalent expressions and to solve problems involving positive rational numbers. *For example*: $\frac{32}{15}\times\frac{5}{6}=\frac{32\times5}{15\times6}=\frac{2\times16\times5}{3\times5\times3\times2}=\frac{16}{9}\times\frac{2}{2}\times\frac{5}{5}=\frac{16}{9}$. *Another example*: Use the distributive law to write: $\frac{1}{2}+\frac{1}{3}\left(\frac{9}{2}-\frac{15}{8}\right)=\frac{1}{2}+\frac{1}{3}\times\frac{9}{2}-\frac{1}{3}\times\frac{15}{8}=\frac{1}{2}+\frac{3}{2}-\frac{5}{8}=2-\frac{5}{8}=1\frac{3}{8}$.	**Student Edition:** 8-9, 30-33, 38-41, 53-56, 72, 73, 668, 669, 670 *Practice Test* 75 #7-#8, #18-#19 **Teacher Edition:** AA 55, 56; AE 39, 53, 54; FMC 39, 54, 152; TNT 152
Understand and interpret equations and inequalities involving variables and positive rational numbers. Use equations and inequalities to represent real-world and mathematical problems; use the idea of maintaining equality to solve equations. Interpret solutions in the original context.	
6.2.3.1 Represent real-world or mathematical situations using equations and inequalities involving variables and positive rational numbers. *For example*: The number of miles *m* in a *k* kilometer race is represented by the equation $m = 0.62\ k$.	**Student Edition:** 50, 51 #20-#21, 66 #13, #21, 67 #24-#26, 128-133, 139 #21-#24, 140 #37-#45, 145 #19-#22, 154 #28-#29, 160 #32, 674, 706 #1-#2, 741 #13-#15 *Graphing Calculator Lab* 68-69 *Practice Test* 75 #24, 173 #3-#6 **Teacher Edition:** AE 129, 130; DI 50; TNT 131
6.2.3.2 Solve equations involving positive rational numbers using number sense, properties of arithmetic and the idea of maintaining equality on both sides of the equation. Interpret a solution in the original context and assess the reasonableness of results. *For example*: A cellular phone company charges $0.12 per minute. If the bill was $11.40 in April, how many minutes were used?	**Student Edition:** 49-52, 73, 136-141, 142-146, 151-155, 170-171, 674, 675, 706 *Algebra Lab* 134-135 *Mid-Chapter Quiz* 147 *Practice Test* 75 #13-#16, 173 **Teacher Edition:** AE 49, 50, 137, 143, 152; TNT 136

STANDARDS	PAGE REFERENCES
Geometry & Measurement	
Calculate perimeter, area, surface area and volume of two- and three-dimensional figures to solve real-world and mathematical problems.	
6.3.1.1 Calculate the surface area and volume of prisms and use appropriate units, such as cm^2 and cm^3. Justify the formulas used. Justification may involve decomposition, nets or other models. *For example*: The surface area of a triangular prism can be derived by decomposing the surface into two triangles and three rectangles.	**Student Edition:** 613-618, 630, 646, 649-653, 662, 700, 703, 715 #5-#7, 722, 748 *Measurement Lab* 600-601, 654-655 *Practice Test* 631 #17-#18 **Teacher Edition:** A 618; AE 614, 650; DI 615; FMC 614, 650; T 646; TNT 614
6.3.1.2 Calculate the area of quadrilaterals. Quadrilaterals include squares, rectangles, rhombuses, parallelograms, trapezoids and kites. When formulas are used, be able to explain why they are valid. *For example*: The area of a kite is one-half the product of the lengths of the diagonals, and this can be justified by decomposing the kite into two triangles.	**Student Edition:** 156-161, 572-576, 578-582, 627, 675, 697, 728 #10 *Graphing Calculator Lab* 624-625 *Measurement Lab* 577 *Mid-Chapter Quiz* 602 *Practice Test* 630 #1, #3 **Teacher Edition:** AE 158, 573, 579; DI 582; FMC 573; ODI 572a; TNT 580
6.3.1.3 Estimate the perimeter and area of irregular figures on a grid when they cannot be decomposed into common figures and use correct units, such as cm and cm^2.	**Student Edition:** 575 #20-#21, 581 #11, 587 #34, 599 #20-#21 *Real-World Example* 580 **Teacher Edition:** AA 599; AE 580
Understand and use relationships between angles in geometric figures.	
6.3.2.1 Solve problems using the relationships between the angles formed by intersecting lines. *For example*: If two streets cross, forming four corners such that one of the corners forms an angle of 120˚, determine the measures of the remaining three angles. *Another example*: Recognize that pairs of interior and exterior angles in polygons have measures that sum to 180˚.	**Student Edition:** 510-513, 514-517, 523 #29, 536 #24, 551 #34, 563, 564, LA10-LA13, 693, 713 #2, #8, 732 #5 *Practice Test* 567 #1-#5 **Teacher Edition:** A 513; AA 513, 536; AE 512, LA11; FMC 511

STANDARDS	PAGE REFERENCES
6.3.2.2 Determine missing angle measures in a triangle using the fact that the sum of the interior angles of a triangle is 180˚. Use models of triangles to illustrate this fact. *For example*: Cut a triangle out of paper, tear off the corners and rearrange these corners to form a straight line. *Another example*: Recognize that the measures of the two acute angles in a right triangle sum to 90˚.	**Student Edition:** 524-529, 530, 564, 694, 713 #5, 732 #5 *Mid-Chapter Quiz* 539 #7-#9 *Practice Test* 567 #7-#8 **Teacher Edition:** AA 529; AE 525; FMC 525; ODI 524a; T 530
6.3.2.3 Develop and use formulas for the sums of the interior angles of polygons by decomposing them into triangles.	**Student Edition:** 534, 547-551, 566, 695, 713 #11 *Geometry Lab* 532 *Practice Test* 567 #13 **Teacher Edition:** F 533; FMC 547; PA 529, 548
Choose appropriate units of measurement and use ratios to convert within measurement systems to solve real-world and mathematical problems.	
6.3.3.1 Solve problems in various contexts involving conversion of weights, capacities, geometric measurements and times within measurement systems using appropriate units.	**Student Edition:** 149 #6, 245 #34, 298-303, 304-309, 320-326, 335, 683, 709 #10, 725 #14, 733 #6-#7 *Practice Test* 337 *Spreadsheet Lab* 327 **Teacher Edition:** AA 302; AE 299, 300, 306, 307; PA 302
6.3.3.2 Estimate weights, capacities and geometric measurements using benchmarks in measurement systems with appropriate units. *For example*: Estimate the height of a house by comparing to a 6-foot man standing nearby.	**Student Edition:** 10-11, 12-13, 230-235, 247 #8, 248-249, 302 #33, 308 #27, 584-588, 589-593, 621 #21-#24, 638 #38-#40, 708 #1, #7, 714 #4 *Mini Lab* 636 *Real-World Example* 307 **Teacher Edition:** AA 235; AE 232; FMC 231, 590, 620; T 230; TNT 248

STANDARDS	PAGE REFERENCES
Data Analysis & Probability	
Use probabilities to solve real-world and mathematical problems; represent probabilities using fractions, decimals and percents.	
6.4.1.1 Determine the sample space (set of possible outcomes) for a given experiment and determine which members of the sample space are related to certain events. Sample space may be determined by the use of tree diagrams, tables or pictorial representations. *For example*: A 6×6 table with entries such as (1,1), (1,2), (1,3), …, (6,6) can be used to represent the sample space for the experiment of simultaneously rolling two number cubes.	**Student Edition:** 190-191, 465-470, 471-474, 499, 500, 691, 712 #4-#7, 729 #22 *Practice Test* 503 #5-#9 **Teacher Edition:** A 470; AA 468; AE 190, 466, 467, 471; FMC 472; PA 474; TNT 465, 467
6.4.1.2 Determine the probability of an event using the ratio between the size of the event and the size of the sample space; represent probabilities as percents, fractions and decimals between 0 and 1 inclusive. Understand that probabilities measure likelihood. *For example*: Each outcome for a balanced number cube has probability $\frac{1}{6}$, and the probability of rolling an even number is $\frac{1}{2}$.	**Student Edition:** 460-464, 465-470, 471-474, 480-483, 484, 486-490, 499, 690, 712, 723 #2 *Mid-Chapter Quiz* 479 *Practice Test* 503 *Probability Lab* 491 **Teacher Edition:** A 464; AE 461, 467, 481, 484, 488; FMC 487
6.4.1.3 Perform experiments for situations in which the probabilities are known, compare the resulting relative frequencies with the known probabilities; know that there may be differences. *For example*: Heads and tails are equally likely when flipping a fair coin, but if several different students flipped fair coins 10 times, it is likely that they will find a variety of relative frequencies of heads and tails.	**Student Edition:** 484-485, 486-490, 501 *Probability Lab* 491 **Teacher Edition:** A 490, 491; AA 485; AE 484; DI 491; F 484; FMC 487; T 486; 491; TNT 484, 486

STANDARDS	PAGE REFERENCES
6.4.1.4 Calculate experimental probabilities from experiments; represent them as percents, fractions and decimals between 0 and 1 inclusive. Use experimental probabilities to make predictions when actual probabilities are unknown. *For example*: Repeatedly draw colored chips with replacement from a bag with an unknown mixture of chips, record relative frequencies, and use the results to make predictions about the contents of the bag.	**Student Edition:** 486-490, 502, 692, 712 #10, 733 #9 *Practice Test* 503 #15 *Probability Lab* 491 #8 **Teacher Edition:** A 490; AA 489, 490; AE 487, 488; DI 491; FMC 487; ODI 486a; TNT 486

Codes Used for Teacher Edition pages

A	Assess
AA	Additional Answers
AE	Additional Examples
DI	Differentiated Instruction
F	Focus
FMC	Focus on Mathematical Content
ODI	Options for Differentiated Instruction
PA	Pre-Ap Activity
RC	Reinforcing the Concept
T	Teach
TNT	Tips for New Teachers