Third Edition

TRANSMATH®

TransMath, **Grades 3–12**

Correlated to the Minnesota Academic Standards in Mathematics

December 2015

VOYAGER SOPRIS
L E A R N I N G®

Minnesota Academic Standards in Mathematics	Lesson Subsection (and Page Number) in *TransMath 1* Where Standard is Addressed	Lesson Subsection (and Page Number) in *TransMath 2* Where Standard is Addressed	Lesson Subsection (and Page Number) in *TransMath 3* Where Standard is Addressed
Grade 3			
Number & Operation: Compare and represent whole numbers up to 100,000 with an emphasis on place value and equality.	**Unit 1:** Lesson 1, Building Number Concepts (9-13); Lesson 2, Building Number Concepts (18-21); Lesson 3, Building Number Concepts (27-29)		
3.1.1.1 Read, write and represent whole numbers up to 100,000. Representations may include numerals, expressions with operations, words, pictures, number lines, and manipulatives such as bundles of sticks and base 10 blocks.	**Unit 1:** Lesson 1, Building Number Concepts (9-13); Lesson 2, Building Number Concepts (18-21); Lesson 3, Building Number Concepts (27-29)		
3.1.1.2 Use place value to describe whole numbers between 1000 and 100,000 in terms of ten thousands, thousands, hundreds, tens and ones.	**Unit 1:** Lesson 1, Building Number Concepts (9-13); Lesson 2, Building Number Concepts (18-21); Lesson 3, Building Number Concepts (27-29); Lesson 12, Building Number Concepts (95-97); Lesson 13, Building Number Concepts (102-103); Lesson 15, Building Number Concepts (113-115)		
3.1.1.3 Find 10,000 more or 10,000 less than a given five-digit number. Find 1000 more or 1000 less than a given four- or five-digit. Find 100 more or 100 less than a given four- or five-digit number.			
3.1.1.4 Round numbers to the nearest 10,000, 1000, 100 and 10. Round up and round down to estimate sums and differences.	**Unit 1:** Lesson 10, Building Number Concepts (77-82); Lesson 11, Building Number Concepts (87-90); Lesson 11, Problem Solving (91-92); Lesson 15, Building Number Concepts (113-115) **Unit 2:** Lesson 6, Building Number Concepts (169-172); Lesson 7, Building Number Concepts (178-180); Lesson 7, Problem Solving (181-182); Lesson 8, Building Number Concepts (184-187); Lesson 8, Problem Solving (188-189); Lesson 9, Building Number Concepts (192-193); Lesson 9, Problem Solving (194-195); Lesson 13, Problem Solving (224-225); Lesson 15, Building Number Concepts (235-238)		
3.1.1.5 Compare and order whole numbers up to 100,000.			
Number & Operation: Add and subtract multi-digit whole numbers; represent multiplication and division in various ways; solve real-world and mathematical problems using arithmetic.	**Unit 2:** Lesson 1, Building Number Concepts (133-135); Lesson 2, Building Number Concepts (140-143); Lesson 3, Building Number Concepts (148-150); Lesson 4, Building Number Concepts (154-157); Lesson 5, Building Number Concepts (162-164); Lesson 6, Building Number Concepts (169-172); Lesson 7, Building Number Concepts (178-180); Lesson 8, Building Number Concepts (184-187); Lesson 9, Building Number Concepts (192-193); Lesson 10, Building Number Concepts (198-		

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	201); Lesson 11, Building Number Concepts (206-208); Lesson 12, Building Number Concepts (213-216); Lesson 13, Building Number Concepts (221-223); Lesson 14, Building Number Concepts (228-230); Lesson 15, Building Number Concepts (235-238)		
3.1.2.1 Add and subtract multi-digit numbers, using efficient and generalizable procedures based on knowledge of place value, including standard algorithms.	**Unit 1:** Lesson 2, Building Number Concepts (18-21); Lesson 3, Building Number Concepts (27-29); Lesson 4, Building Number Concepts (34-35); Lesson 6, Building Number Concepts (47-49); Lesson 7, Building Number Concepts (54-57); Lesson 8, Building Number Concepts (62-64); Lesson 9, Building Number Concepts (69-72); Lesson 12, Building Number Concepts (95-97); Lesson 13, Building Number Concepts (102-103); Lesson 15, Building Number Concepts (113-115) **Unit 2:** Lesson 1, Building Number Concepts (133-135); Lesson 2, Building Number Concepts (140-143); Lesson 3, Building Number Concepts (148-150); Lesson 4, Building Number Concepts (154-157); Lesson 5, Building Number Concepts (162-164); Lesson 6, Building Number Concepts (169-172); Lesson 8, Building Number Concepts (184-187); Lesson 9, Building Number Concepts (192-193); Lesson 10, Building Number Concepts (198-201); Lesson 11, Building Number Concepts (206-208); Lesson 12, Building Number Concepts (213-216); Lesson 13, Building Number Concepts (221-223); Lesson 14, Building Number Concepts (228-230); Lesson 15, Building Number Concepts (235-238)		
3.1.2.2 Use addition and subtraction to solve real-world and mathematical problems involving whole numbers. Use various strategies, including the relationship between addition and subtraction, the use of technology, and the context of the problem to assess the reasonableness of results.	**Unit 1:** Lesson 1, Problem Solving (14-15); Lesson 2, Problem Solving (22-24); Lesson 3, Problem Solving (30-31) **Unit 2:** Lesson 1, Building Number Concepts (133-135); Lesson 1, Problem Solving (134-137); Lesson 2, Building Number Concepts (140-143); Lesson 2, Problem Solving (144-145); Lesson 3, Building Number Concepts (148-150); Lesson 3, Problem Solving (151-152); Lesson 4, Building Number Concepts (154-157); Lesson 4, Problem Solving (158-159); Lesson 5, Building Number Concepts (162-164); Lesson 6, Building Number Concepts (169-172); Lesson 6, Problem Solving (173-175); Lesson 7, Building Number Concepts (178-180);		

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	Lesson 7, Problem Solving (181-182); Lesson 8, Building Number Concepts (184-187); Lesson 8, Problem Solving (188-189); Lesson 9, Building Number Concepts (192-193); Lesson 9, Problem Solving (194-195); Lesson 10, Building Number Concepts (198-201); Lesson 11, Building Number Concepts (206-208); Lesson 11, Problem Solving (209-210); Lesson 12, Building Number Concepts (213-216); Lesson 12, Problem Solving (217-218); Lesson 13, Building Number Concepts (221-223); Lesson 13, Problem Solving (224-225); Lesson 14, Building Number Concepts (228-230); Lesson 15, Building Number Concepts (235-238); Lesson 15, Problem Solving (239-240)		
3.1.2.3 Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line and skip counting. Represent division facts by using a variety of approaches, such as repeated subtraction, equal sharing and forming equal groups. Recognize the relationship between multiplication and division.	**Unit 3:** Lesson 13, Problem Solving (346-351); Lesson 14, Problem Solving (354-357) **Unit 4:** Lesson 1, Building Number Concepts (383-385); Lesson 1, Problem Solving (386-388); Lesson 2, Building Number Concepts (391-394); Lesson 2, Problem Solving (395-397); Lesson 3, Building Number Concepts (400-402); Lesson 3, Problem Solving (403-404); Lesson 4, Building Number Concepts (407-409)		
3.1.2.4 Solve real-world and mathematical problems involving multiplication and division, including both "how many in each group" and "how many groups" division problems.	**Unit 4:** Lesson 2, Problem Solving (395-397); Lesson 4, Building Number Concepts (407-409); Lesson 4, Problem Solving (410-411); Lesson 5, Problem Solving (414-417); Lesson 6, Problem Solving (426-427); Lesson 15, Building Number Concepts (494-500); Lesson 15, Problem Solving (501-503)		
3.1.2.5 Use strategies and algorithms based on knowledge of place value, equality and properties of addition and multiplication to multiply a two- or three-digit number by a one-digit number. Strategies may include mental strategies, partial products, the standard algorithm, and the commutative, associative, and distributive properties.	**Unit 3:** Lesson 1, Building Number Concepts (253-255); Lesson 2, Building Number Concepts (262-264); Lesson 3, Building Number Concepts (270-272); Lesson 4, Building Number Concepts (278-280); Lesson 5, Building Number Concepts (285-288); Lesson 6, Building Number Concepts (293-296)		
Number & Operation: Understand meanings and uses of fractions in real-world and mathematical situations.			
3.1.3.1 Read and write fractions with words and symbols. Recognize that fractions can be used to represent parts of a whole, parts of a set, points on a number line, or distances on a number line.	**Unit 8:** Lesson 1, Building Number Concepts (837-841); Lesson 2, Building Number Concepts (847-849); Lesson 3, Building Number Concepts (854-857); Lesson 4, Building Number Concepts (864-868); Lesson 6, Building Number Concepts (881-884); Lesson 7, Building Number Concepts (890-	**Unit 1:** Lesson 1, Building Number Concepts (9-11); Lesson 1, Problem Solving (12-13); Lesson 2, Building Number Concepts (16-18); Lesson 2, Problem Solving (19-20); Lesson 3, Building Number Concepts (23-26); Lesson 3, Problem Solving (27-29); Lesson 4, Building Number	

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	892); Lesson 8, Building Number Concepts (897-899); Lesson 9, Building Number Concepts (905-907); Lesson 14, Building Number Concepts (943-945)	Concepts (32-34); Lesson 4, Problem Solving (35-37); Lesson 5, Building Number Concepts (40-43); Lesson 6, Building Number Concepts (48-50); Lesson 6, Problem Solving (51-53); Lesson 7, Building Number Concepts (56-58); Lesson 7, Problem Solving (59-62); Lesson 8, Building Number Concepts (65-67);Lesson 8, Problem Solving (68-69); Lesson 9, Building Number Concepts (72-75); Lesson 9, Problem Solving (76-78); Lesson 10, Building Number Concepts (81-88); Lesson 10, Problem Solving (89-92)	
3.1.3.2 Understand that the size of a fractional part is relative to the size of the whole.	**Unit 8:** Lesson 10, Building Number Concepts (913-915); Lesson 11, Building Number Concepts (920-922)	**Unit 1:** Lesson 1, Building Number Concepts (9-11); Lesson 1, Problem Solving (12-13); Lesson 2, Building Number Concepts (16-18); Lesson 2, Problem Solving (19-20); Lesson 3, Building Number Concepts (23-26); Lesson 3, Problem Solving (27-29); Lesson 4, Building Number Concepts (32-34); Lesson 4, Problem Solving (35-37); Lesson 5, Building Number Concepts (40-43); Lesson 6, Building Number Concepts (48-50); Lesson 6, Problem Solving (51-53); Lesson 7, Building Number Concepts (56-58); Lesson 7, Problem Solving (59-62); Lesson 8, Building Number Concepts (65-67); Lesson 8, Problem Solving (68-69); Lesson 9, Building Number Concepts (72-75); Lesson 9, Problem Solving (76-78); Lesson 10, Building Number Concepts (81-88); Lesson 10, Problem Solving (89-92) **Unit 2:** Lesson 1, Problem Solving (109-112); Lesson 2, Problem Solving (118-120)	
3.1.3.3 Order and compare unit fractions and fractions with like denominators by using models and an understanding of the concept of numerator and denominator.			
Algebra: Use single-operation input-output rules to represent patterns and relationships and to solve real-world and mathematical problems.			
3.2.1.1 Create, describe, and apply single-operation input-output rules involving addition, subtraction and multiplication to solve problems in various contexts.			
Algebra: Use number sentences involving multiplication and division basic facts and unknowns to represent and solve real-world and mathematical problems; create real-world situations corresponding			

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to number sentences.			
3.2.2.1 Understand how to interpret number sentences involving multiplication and division basic facts and unknowns. Create real-world situations to represent number sentences.			
3.2.2.2 Use multiplication and division basic facts to represent a given problem situation using a number sentence. Use number sense and multiplication and division basic facts to find values for the unknowns that make the number sentences true.			
Geometry & Measurement: Use geometric attributes to describe and create shapes in various contexts.			
3.3.1.1 Identify parallel and perpendicular lines in various contexts, and use them to describe and create geometric shapes, such as right triangles, rectangles, parallelograms and trapezoids.	**Unit 6:** Lesson 1, Problem Solving (649-651); Lesson 2, Problem Solving (659-661); Lesson 3, Problem Solving (668-670); Lesson 10, Problem Solving (727-730)	**Unit 5:** Lesson 3, Problem Solving (518-519)	
3.3.1.2 Sketch polygons with a given number of sides or vertices (corners), such as pentagons, hexagons and octagons.			
Geometry & Measurement: Understand perimeter as a measurable attribute of real-world and mathematical objects. Use various tools to measure distances.			
3.3.2.1 Use half units when measuring distances.	**Unit 9:** Lesson 7, Building Number Concepts (1020-1022); Lesson 7, Problem Solving (1023-1025)		
3.3.2.2 Find the perimeter of a polygon by adding the lengths of the sides.	**Unit 5:** Lesson 6, Problem Solving (558-561); Lesson 7, Problem Solving (568-569); Lesson 8, Problem Solving (575-576); Lesson 9, Problem Solving (579-583); Lesson 11, Problem Solving (598-599); Lesson 12, Problem Solving (606-608); Lesson 14, Problem Solving (621-622); Lesson 15, Problem Solving (629-632)	**Unit 6:** Lesson 9, Problem Solving (700-704)	
3.3.2.3 Measure distances around objects.		**Unit 3:** Lesson 2, Problem Solving (268-269) **Unit 6:** Lesson 9, Problem Solving (700-704)	
Geometry & Measurement: Use time, money and temperature to solve real-world and mathematical problems.			
3.3.3.1 Tell time to the minute, using digital and analog clocks. Determine elapsed time to the minute.			
3.3.3.2 Know relationships among units of time.			
3.3.3.3 Make change up to one dollar in several different ways, including with as few coins as possible.			

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3.3.3.4 Use an analog thermometer to determine temperature to the nearest degree in Fahrenheit and Celsius.			
Data Analysis: Collect, organize, display, and interpret data. Use labels and a variety of scales and units in displays.	**Unit 1:** Lesson 4, Problem Solving (36-38); Lesson 5, Problem Solving (41-42); Lesson 6, Problem Solving (50-51); Lesson 7, Problem Solving (58-59); Lesson 8, Problem Solving (65-66); Lesson 9, Problem Solving (72-74); Lesson 11, Problem Solving (91-92); Lesson 12, Problem Solving (98-99); Lesson 13, Problem Solving (104-105); Lesson 14, Problem Solving (108-110); Lesson 15, Problem Solving (117-120) **Unit 2:** Lesson 2, Problem Solving (144-145); Lesson 3, Problem Solving (151-152); Lesson 4, Problem Solving (158-159); Lesson 6, Problem Solving (173-175); Lesson 14, Problem Solving (231-232); Lesson 15, Problem Solving (239-240)		
3.4.1.1 Collect, display and interpret data using frequency tables, bar graphs, picture graphs and number line plots having a variety of scales. Use appropriate titles, labels and units.	**Unit 1:** Lesson 4, Problem Solving (36-38); Lesson 5, Problem Solving (41-42); Lesson 6, Problem Solving (50-51); Lesson 7, Problem Solving (58-59); Lesson 8, Problem Solving (65-66); Lesson 9, Problem Solving (72-74); Lesson 11, Problem Solving (91-92); Lesson 12, Problem Solving (98-99); Lesson 13, Problem Solving (104-105); Lesson 14, Problem Solving (108-110); Lesson 15, Problem Solving (117-120) **Unit 2:** Lesson 2, Problem Solving (144-145); Lesson 3, Problem Solving (151-152); Lesson 4, Problem Solving (158-159); Lesson 6, Problem Solving (173-175); Lesson 14, Problem Solving (231-232); Lesson 15, Problem Solving (239-240) **Unit 9:** Lesson 5, Problem Solving (1005-1007); Lesson 6, Problem Solving (1016-1017); Lesson 7, Problem Solving (1023-1025); Lesson 8, Problem Solving (1032-1033)	**Unit 8:** Lesson 4, Problem Solving (889-892); Lesson 6, Problem Solving (908-910); Lesson 15, Problem Solving (983-987)	

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Grade 4			
Number & Operation: Demonstrate mastery of multiplication and division basic facts; multiply multi-digit numbers; solve real-world and mathematical problems using arithmetic.			
4.1.1.1 Demonstrate fluency with multiplication and division facts.	**Unit 4:** Lesson 1, Building Number Concepts (383-385); Lesson 2, Building Number Concepts (391-394); Lesson 3, Building Number Concepts (400-402); Lesson 4, Building Number Concepts (407-409) **Unit 5:** Lesson 1, Building Number Concepts (515-518); Lesson 3, Building Number Concepts (530-532); Lesson 4, Building Number Concepts (538-541); Lesson 5, Building Number Concepts (546-550); Lesson 6, Building Number Concepts (555-557); Lesson 7, Building Number Concepts (564-567); Lesson 8, Building Number Concepts (572-574); Lesson 10, Building Number Concepts (586-588); Lesson 11, Building Number Concepts (593-597); Lesson 12, Building Number Concepts (602-605); Lesson 13, Building Number Concepts (611-613); Lesson 14, Building Number Concepts (618-620); Lesson 15, Building Number Concepts (625-628) **Unit 6:** Lesson 1, Building Number Concepts (645-648); Lesson 2, Building Number Concepts (654-658); Lesson 3, Building Number Concepts (664-667); Lesson 4, Building Number Concepts (673-676); Lesson 5, Building Number Concepts (681-683); Lesson 6, Building Number Concepts (687-691); Lesson 10, Building Number Concepts (722-726)		
4.1.1.2 Use an understanding of place value to multiply a number by 10, 100 and 1000.	**Unit 3:** Lesson 1, Building Number Concepts (253-255); Lesson 1, Problem Solving (256-259); Lesson 2, Building Number Concepts (262-264); Lesson 2, Problem Solving (265-267); Lesson 3, Building Number Concepts (270-272); Lesson 4, Building Number Concepts (278-280); Lesson 5, Building Number Concepts (285-288); Lesson 6, Building Number Concepts (293-296); Lesson 7, Building Number Concepts (301-304); Lesson 8, Building Number Concepts (309-312); Lesson 9, Building Number Concepts (318-320); Lesson 10, Building Number Concepts (326-328); Lesson 11, Building Number Concepts (334-336); Lesson 15, Building		

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	Number Concepts (360-363) **Unit 4:** Lesson 1, Problem Solving (386-388); Lesson 2, Building Number Concepts (391-394); Lesson 3, Problem Solving (403-404)		
4.1.1.3 Multiply multi-digit numbers, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms.	**Unit 3:** Lesson 2, Problem Solving (265-267); Lesson 4, Problem Solving (281-282); Lesson 5, Building Number Concepts (285-288); Lesson 6, Building Number Concepts (293-296); Lesson 6, Problem Solving (297-298); Lesson 7, Building Number Concepts (301-304); Lesson 7, Problem Solving (305-306); Lesson 8, Building Number Concepts (309-312); Lesson 8, Problem Solving (313-315); Lesson 9, Building Number Concepts (318-320); Lesson 9, Problem Solving (321-323); Lesson 10, Building Number Concepts (326-328); Lesson 11, Building Number Concepts (334-336); Lesson 11, Problem Solving (337-338); Lesson 13, Problem Solving (346-351); Lesson 14, Problem Solving (354-357); Lesson 15, Building Number Concepts (360-363); Lesson 15, Problem Solving (364-369)		
4.1.1.4 Estimate products and quotients of multi-digit whole numbers by using rounding, benchmarks and place value to assess the reasonableness of results.	**Unit 3:** Lesson 8, Building Number Concepts (309-312); Lesson 10, Building Number Concepts (326-328); Lesson 11, Building Number Concepts (334-336); Lesson 15, Building Number Concepts (360-363) **Unit 4:** Lesson 11, Building Number Concepts (462-464); Lesson 13, Building Number Concepts (476-480); Lesson 14, Building Number Concepts (486-488); Lesson 15, Building Number Concepts (494-500)		
4.1.1.5 Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of technology, and the context of the problem to assess the reasonableness of results.	**Unit 3:** Lesson 8, Problem Solving (313-315); Lesson 9, Problem Solving (321-323); Lesson 11, Problem Solving (337-338); Lesson 15, Problem Solving (364-369) **Unit 4:** Lesson 15, Building Number Concepts (494-500)		
4.1.1.6 Use strategies and algorithms based on knowledge of place value, equality and properties of operations to divide multi-digit whole numbers by one- or two-digit numbers. Strategies may include mental strategies, partial quotients, the commutative, associative, and distributive properties and repeated subtraction.	**Unit 4:** Lesson 6, Building Number Concepts (422-425); Lesson 6, Problem Solving (426-427); Lesson 7, Problem Solving (432-435); Lesson 8, Problem Solving (441-443); Lesson 11, Problem Solving (465-467)		
Number & Operation: Represent and compare fractions and decimals in real-world and mathematical			

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situations; use place value to understand how decimals represent quantities.			
4.1.2.1 Represent equivalent fractions using fraction models such as parts of a set, fraction circles, fraction strips, number lines and other manipulatives. Use the models to determine equivalent fractions.	**Unit 8:** Lesson 12, Building Number Concepts (928-931); Lesson 13, Building Number Concepts (936-940); Lesson 15, Building Number Concepts (950-954)	**Unit 2:** Lesson 7, Building Number Concepts (160-163); Lesson 7, Problem Solving (164-166); Lesson 8, Building Number Concepts (169-174); Lesson 9, Building Number Concepts (180-184); Lesson 10, Building Number Concepts (189-193); Lesson 11, Building Number Concepts (198-201); Lesson 12, Building Number Concepts (207-210); Lesson 13, Building Number Concepts (215-219); Lesson 14, Building Number Concepts (224-227); Lesson 15, Building Number Concepts (232-239)	
4.1.2.2 Locate fractions on a number line. Use models to order and compare whole numbers and fractions, including mixed numbers and improper fractions.	**Unit 8:** Lesson 1, Building Number Concepts (837-841); Lesson 2, Building Number Concepts (847-849); Lesson 6, Building Number Concepts (881-884); Lesson 7, Building Number Concepts (890-892); Lesson 9, Building Number Concepts (905-907); Lesson 10, Building Number Concepts (913-915); Lesson 11, Building Number Concepts (920-922)	**Unit 1:** Lesson 1, Building Number Concepts (9-11); Lesson 2, Building Number Concepts (16-18); Lesson 3, Building Number Concepts (23-26); Lesson 4, Building Number Concepts (32-34); Lesson 5, Building Number Concepts (40-43); Lesson 6, Building Number Concepts (48-50); Lesson 7, Building Number Concepts (56-58); Lesson 8, Building Number Concepts (65-67); Lesson 9, Building Number Concepts (72-75); Lesson 10, Building Number Concepts (81-88) **Unit 2:** 1, Building Number Concepts (107-108); Lesson 1, Problem Solving (109-112); Lesson 2, Building Number Concepts (115-117); Lesson 2, Problem Solving (118-120); Lesson 3, Building Number Concepts (123-127); Lesson 3, Problem Solving (128-129); Lesson 4, Building Number Concepts (133-135); Lesson 4, Problem Solving (136-138); Lesson 5, Building Number Concepts (141-145); Lesson 15, Building Number Concepts (232-239)	
4.1.2.3 Use fraction models to add and subtract fractions with like denominators in real-world and mathematical situations. Develop a rule for addition and subtraction of fractions with like denominators.	**Unit 9:** Lesson 1, Building Number Concepts (971-975); Lesson 2, Building Number Concepts (981-984); Lesson 3, Building Number Concepts (989-990)		**Unit 1:** Lesson 1, Building Number Concepts (9-13)
4.1.2.4 Read and write decimals with words and symbols; use place value to describe decimals in terms of thousands, hundreds, tens, ones, tenths, hundredths and thousandths.	**Unit 8:** Lesson 7, Building Number Concepts (890-892)	**Unit 5:** Lesson 1, Building Number Concepts (495-499); Lesson 2, Building Number Concepts (504-507); Lesson 3, Building Number Concepts (513-517); Lesson 4, Building Number Concepts (522-524); Lesson 5, Building Number Concepts (529-533); Lesson 6, Building Number Concepts (538-540); Lesson 7, Building Number Concepts (545-549); Lesson 8, Building Number Concepts (554-557); Lesson 9, Building Number Concepts (563-	

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		568); Lesson 10, Building Number Concepts (573-576); Lesson 11, Building Number Concepts (581-586); Lesson 12, Building Number Concepts (589-593); Lesson 13, Building Number Concepts (597-601); Lesson 14, Building Number Concepts (606-611); Lesson 15, Building Number Concepts (616-620)	
4.1.2.5 Compare and order decimals and whole numbers using place value, a number line and models such as grids and base 10 blocks.		**Unit 5:** Lesson 1, Building Number Concepts (495-499); Lesson 2, Building Number Concepts (504-507); Lesson 3, Building Number Concepts (513-517); Lesson 4, Building Number Concepts (522-524); Lesson 5, Building Number Concepts (529-533); Lesson 6, Building Number Concepts (538-540); Lesson 7, Building Number Concepts (545-549); Lesson 8, Building Number Concepts (554-557); Lesson 9, Building Number Concepts (563-568); Lesson 10, Building Number Concepts (573-576); Lesson 11, Building Number Concepts (581-586); Lesson 14, Building Number Concepts (606-611); Lesson 15, Building Number Concepts (616-620)	**Unit 1:** Lesson 10, Building Number Concepts (104-107)
4.1.2.6 Read and write tenths and hundredths in decimal and fraction notations using words and symbols; know the fraction and decimal equivalents for halves and fourths.	**Unit 8:** Lesson 9, Building Number Concepts (905-907)	**Unit 5:** Lesson 2, Building Number Concepts (504-507); Lesson 3, Building Number Concepts (513-517); Lesson 4, Building Number Concepts (522-524); Lesson 5, Building Number Concepts (529-533); Lesson 6, Building Number Concepts (538-540); Lesson 7, Building Number Concepts (545-549); Lesson 8, Building Number Concepts (554-557); Lesson 9, Building Number Concepts (563-568); Lesson 10, Building Number Concepts (573-576); Lesson 11, Building Number Concepts (581-586); Lesson 14, Building Number Concepts (606-611); Lesson 15, Building Number Concepts (616-620)	
4.1.2.7 Round decimals to the nearest tenth.		**Unit 5:** Lesson 12, Building Number Concepts (589-593); Lesson 13, Building Number Concepts (597-601) **Unit 6:** Lesson 14, Building Number Concepts (740-744); Lesson 15, Building Number Concepts (747-751)	
Algebra: Use input-output rules, tables and charts to represent patterns and relationships and to solve real-world and mathematical problems.			

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4.2.1.1 Create and use input-output rules involving addition, subtraction, multiplication and division to solve problems in various contexts. Record the inputs and outputs in a chart or table.	**Unit 7:** Lesson 1, Building Number Concepts (743-746)		
Algebra: Use number sentences involving multiplication, division and unknowns to represent and solve real-world and mathematical problems; create real-world situations corresponding to number sentences.			
4.2.2.1 Understand how to interpret number sentences involving multiplication, division and unknowns. Use real-world situations involving multiplication or division to represent number sentences.			
4.2.2.2 Use multiplication, division and unknowns to represent a given problem situation using a number sentence. Use number sense, properties of multiplication, and the relationship between multiplication and division to find values for the unknowns that make the number sentences true.			
Geometry & Measurement: Name, describe, classify and sketch polygons.		**Unit 5:** Lesson 14, Problem Solving (612-613); Lesson 15, Problem Solving (621-627)	
4.3.1.1 Describe, classify and sketch triangles, including equilateral, right, obtuse and acute triangles. Recognize triangles in various contexts.		**Unit 4:** Lesson 8, Problem Solving (464-465); Lesson 10, Problem Solving (478-482) **Unit 5:** Lesson 1, Problem Solving (500-501); Lesson 2, Problem Solving (508-510); Lesson 4, Problem Solving (525-526); Lesson 7, Problem Solving (550-551); Lesson 12, Problem Solving (594-595); Lesson 13, Problem Solving (602-603); Lesson 15, Problem Solving (621-627)	**Unit 7:** Lesson 1, Problem Solving (755-760); Lesson 2, Problem Solving (766-769); Lesson 1, Problem Solving (755-760)
4.3.1.2 Describe, classify and draw quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms and kites. Recognize quadrilaterals in various contexts.		**Unit 4:** Lesson 8, Problem Solving (464-465); Lesson 10, Problem Solving (478-482) **Unit 5:** Lesson 3, Problem Solving (518-519); Lesson 4, Problem Solving (525-526); Lesson 7, Problem Solving (550-551); Lesson 8, Problem Solving (558-560); Lesson 9, Problem Solving (569-570); Lesson 12, Problem Solving (594-595); Lesson 13, Problem Solving (602-603); Lesson 15, Problem Solving (621-627)	
Geometry & Measurement: Understand angle and area as measurable attributes of real-world and mathematical objects. Use various tools to measure angles and areas.			

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4.3.2.1 Measure angles in geometric figures and real-world objects with a protractor or angle ruler.		**Unit 3:** Lesson 1, Problem Solving (260-262); Lesson 4, Problem Solving (283-285); Lesson 6, Building Number Concepts (297-301); Lesson 6, Problem Solving (302-304); Lesson 7, Problem Solving (311-314); Lesson 12, Building Number Concepts (350-354) **Unit 4:** Lesson 4, Problem Solving (432-435); Lesson 7, Problem Solving (457-459) **Unit 5:** Lesson 1, Problem Solving (500-501); Lesson 2, Problem Solving (508-510); Lesson 8, Problem Solving (558-560); Lesson 9, Problem Solving (569-570) **Unit 6:** Lesson 8, Problem Solving (695-697)	**Unit 7:** Lesson 2, Problem Solving (766-769); Lesson 4, Problem Solving (786-790); Lesson 5, Problem Solving (793-796); Lesson 6, Problem Solving (805-808); Lesson 7, Problem Solving (816-819); Lesson 8, Problem Solving (826-828); Lesson 9, Problem Solving (834-836); Lesson 10, Problem Solving (844-851)
4.3.2.2 Compare angles according to size. Classify angles as acute, right and obtuse.		**Unit 3:** Lesson 6, Building Number Concepts (297-301); Lesson 6, Problem Solving (302-304); Lesson 7, Problem Solving (311-314)	**Unit 7:** Lesson 1, Problem Solving (755-760); Lesson 2, Problem Solving (766-769); Lesson 4, Problem Solving (786-790); Lesson 5, Problem Solving (793-796); Lesson 6, Problem Solving (805-808); Lesson 7, Problem Solving (816-819); Lesson 8, Problem Solving (826-828); Lesson 9, Problem Solving (834-836); Lesson 10, Problem Solving (844-851)
4.3.2.3 Understand that the area of a two-dimensional figure can be found by counting the total number of same size square units that cover a shape without gaps or overlaps. Justify why length and width are multiplied to find the area of a rectangle by breaking the rectangle into one unit by one unit squares and viewing these as grouped into rows and columns.	**Unit 5:** Lesson 1, Problem Solving (519-520); Lesson 2, Problem Solving (523-527); Lesson 3, Problem Solving (533-535); Lesson 4, Problem Solving (542-543); Lesson 8, Problem Solving (575-576); Lesson 9, Problem Solving (579-583); Lesson 11, Problem Solving (598-599); Lesson 12, Problem Solving (606-608); Lesson 13, Problem Solving (614-615); Lesson 14, Problem Solving (621-622); Lesson 15, Problem Solving (629-632)	**Unit 6:** Lesson 1, Problem Solving (644-646); Lesson 2, Problem Solving (653-654)	
4.3.2.4 Find the areas of geometric figures and real-world objects that can be divided into rectangular shapes. Use square units to label area measurements.	**Unit 5:** Lesson 1, Problem Solving (519-520); Lesson 2, Problem Solving (523-527); Lesson 3, Problem Solving (533-535); Lesson 4, Problem Solving (542-543); Lesson 8, Problem Solving (575-576); Lesson 9, Problem Solving (579-583); Lesson 11, Problem Solving (598-599); Lesson 12, Problem Solving (606-608); Lesson 13, Problem Solving (614-615); Lesson 14, Problem Solving (621-622); Lesson 15, Problem Solving (629-632) **Unit 6:** Lesson 4, Problem Solving (677-678); Lesson 6, Problem Solving (692-693); Lesson 10, Problem Solving (727-730)	**Unit 6:** Lesson 1, Problem Solving (644-646); Lesson 2, Problem Solving (653-654); Lesson 4, Problem Solving (663-666); Lesson 5, Problem Solving (669-673); Lesson 6, Problem Solving (682-684)	
Geometry & Measurement: Use translations, reflections and rotations to establish congruency and understand symmetries.			

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4.3.3.1 Apply translations (slides) to figures.			
4.3.3.2 Apply reflections (flips) to figures by reflecting over vertical or horizontal lines and relate reflections to lines of symmetry.		**Unit 5:** Lesson 6, Problem Solving (541-542) **Unit 8:** Lesson 12, Problem Solving (953-956); Lesson 15, Problem Solving (983-987)	
4.3.3.3 Apply rotations (turns) of 90° clockwise or counterclockwise.		**Unit 4:** Lesson 3, Problem Solving (423-425); Lesson 4, Problem Solving (432-435); Lesson 7, Problem Solving (457-459); Lesson 10, Problem Solving (478-482)	
4.3.3.4 Recognize that translations, reflections and rotations preserve congruency and use them to show that two figures are congruent.		**Unit 4:** Lesson 10, Problem Solving (478-482)	
Data Analysis: Collect, organize, display and interpret data, including data collected over a period of time and data represented by fractions and decimals.			
4.4.1.1 Use tables, bar graphs, time lines and Venn diagrams to display data sets. The data may include fractions or decimals. Understand that spreadsheet tables and graphs can be used to display data.	**Unit 9:** Lesson 5, Problem Solving (1005-1007); Lesson 6, Problem Solving (1016-1017)	**Unit 8:** Lesson 1, Problem Solving (866-867); Lesson 3, Problem Solving (882-883)	

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Grade 5			

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Number & Operation: Divide multi-digit numbers; solve real world and mathematical problems using arithmetic.			
5.1.1.1 Divide multi-digit numbers, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms. Recognize that quotients can be represented in a variety of ways, including a whole number with a remainder, a fraction or mixed number, or a decimal.	**Unit 4:** Lesson 6, Building Number Concepts (422-425); Lesson 6, Problem Solving (426-427); Lesson 7, Building Number Concepts (430-431); Lesson 7, Problem Solving (432-435); Lesson 8, Building Number Concepts (438-440); Lesson 8, Problem Solving (441-443); Lesson 9, Building Number Concepts (445-448); Lesson 9, Problem Solving (449-451); Lesson 10, Building Number Concepts (454-457); Lesson 11, Building Number Concepts (462-464); Lesson 11, Problem Solving (465-467); Lesson 12, Problem Solving (470-473); Lesson 13, Building Number Concepts (476-480); Lesson 13, Problem Solving (481-483); Lesson 14, Building Number Concepts (486-488); Lesson 14, Problem Solving (489-491); Lesson 15, Building Number Concepts (494-500); Lesson 15, Problem Solving (501-503)		
5.1.1.2 Consider the context in which a problem is situated to select the most useful form of the quotient for the solution and use the context to interpret the quotient appropriately.	**Unit 4:** Lesson 9, Problem Solving (449-451); Lesson 11, Problem Solving (465-467); Lesson 12, Problem Solving (470-473); Lesson 13, Problem Solving (481-483); Lesson 14, Problem Solving (489-491); Lesson 15, Problem Solving (501-503)		
5.1.1.3 Estimate solutions to arithmetic problems in order to assess the reasonableness of results.			
5.1.1.4 Solve real-world and mathematical problems requiring addition, subtraction, multiplication and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results.	**Unit 4:** Lesson 14, Problem Solving (489-491); Lesson 15, Problem Solving (501-503)		
Number & Operation: Read, write, represent and compare fractions and decimals; recognize and write equivalent fractions; convert between fractions and decimals; use fractions and decimals in real-world and mathematical situations.			
5.1.2.1 Read and write decimals using place value to describe decimals in terms of groups from millionths to millions.		**Unit 5:** Lesson 12, Building Number Concepts (589-593); Lesson 13, Building Number Concepts (597-601)	
5.1.2.2 Find 0.1 more than a number and 0.1 less than a number. Find 0.01 more than a number and 0.01 less than a number. Find 0.001 more than a number			

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and 0.001 less than a number.			
5.1.2.3 Order fractions and decimals, including mixed numbers and improper fractions, and locate on a number line.		**Unit 1:** Lesson 7, Building Number Concepts (56-58) **Unit 2:** Lesson 4, Building Number Concepts (133-135); Lesson 5, Building Number Concepts (141-145); Lesson 15, Problem Solving (240-243) **Unit 3:** Lesson 11, Building Number Concepts (342-345) **Unit 5:** Lesson 11, Building Number Concepts (581-586); Lesson 15, Building Number Concepts (616-620)	
5.1.2.4 Recognize and generate equivalent decimals, fractions, mixed numbers and improper fractions in various contexts.	**Unit 8:** Lesson 12, Building Number Concepts (928-931); Lesson 13, Building Number Concepts (936-940); Lesson 15, Building Number Concepts (950-954)	**Unit 4:** Lesson 5, Building Number Concepts (438-440) **Unit 5:** Lesson 9, Building Number Concepts (563-568); Lesson 10, Building Number Concepts (573-576); Lesson 11, Building Number Concepts (581-586); Lesson 14, Building Number Concepts (606-611); Lesson 15, Building Number Concepts (616-620)	**Unit 1:** Lesson 2, Building Number Concepts (20-27); Lesson 7, Building Number Concepts (72-75)
5.1.2.5 Round numbers to the nearest 0.1, 0.01 and 0.001.		**Unit 5:** Lesson 12, Building Number Concepts (589-593); Lesson 13, Building Number Concepts (597-601) **Unit 6:** Lesson 2, Building Number Concepts (649-652); Lesson 3, Building Number Concepts (657-660)	**Unit 1:** Lesson 8, Building Number Concepts (83-87)
Number & Operation: Add and subtract fractions, mixed numbers and decimals to solve real-world and mathematical problems.			
5.1.3.1 Add and subtract decimals and fractions, using efficient and generalizable procedures, including standard algorithms.	**Unit 9:** Lesson 1, Building Number Concepts (971-975); Lesson 2, Building Number Concepts (981-984); Lesson 3, Building Number Concepts (989-990); Lesson 4, Building Number Concepts (997-1000); Lesson 6, Building Number Concepts (1012-1015); Lesson 8, Building Number Concepts (1028-1031); Lesson 8, Problem Solving (1032-1033); Lesson 10, Building Number Concepts (1041-1044)	**Unit 2:** Lesson 6, Problem Solving (155-157); Lesson 8, Building Number Concepts (169-174); Lesson 8, Problem Solving (175-177); Lesson 9, Building Number Concepts (180-184); Lesson 9, Problem Solving (185-186); Lesson 10, Building Number Concepts (189-193); Lesson 11, Building Number Concepts (198-201); Lesson 11, Problem Solving (202-204); Lesson 12, Building Number Concepts (207-210); Lesson 12, Problem Solving (211-212); Lesson 13, Building Number Concepts (215-219); Lesson 13, Problem Solving (220-221); Lesson 14, Building Number Concepts (224-227); Lesson 14, Problem Solving (228-229); Lesson 15, Building Number Concepts (232-239); Lesson 15, Problem Solving (240-243) **Unit 3:** Lesson 14, Building Number Concepts (369-371); Lesson 14, Problem Solving (372-374)	**Unit 1:** Lesson 2, Building Number Concepts (20-27); Lesson 6, Building Number Concepts (60-63); Lesson 9, Building Number Concepts (95-97); Lesson 15, Building Number Concepts (145-152)

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		Unit 4: Lesson 1, Building Number Concepts (397-401); Lesson 2, Building Number Concepts (406-411); Lesson 3, Building Number Concepts (416-422); Lesson 4, Building Number Concepts (428-431); Lesson 8, Building Number Concepts (462-463); Lesson 10, Building Number Concepts (475-477) **Unit 6:** Lesson 1, Building Number Concepts (639-643); Lesson 14, Building Number Concepts (740-744); Lesson 15, Building Number Concepts (747-751)	
5.1.3.2 Model addition and subtraction of fractions and decimals using a variety of representations.	**Unit 9:** Lesson 1, Building Number Concepts (971-975); Lesson 2, Building Number Concepts (981-984); Lesson 3, Building Number Concepts (989-990); Lesson 4, Building Number Concepts (997-1000)	**Unit 2:** Lesson 8, Building Number Concepts (169-174); Lesson 9, Building Number Concepts (180-184); Lesson 10, Building Number Concepts (189-193); Lesson 11, Building Number Concepts (198-201); Lesson 12, Building Number Concepts (207-210); Lesson 13, Building Number Concepts (215-219); Lesson 14, Building Number Concepts (224-227); Lesson 15, Building Number Concepts (232-239) **Unit 6:** Lesson 1, Building Number Concepts (639-643)	
5.1.3.3 Estimate sums and differences of decimals and fractions to assess the reasonableness of results.		**Unit 2:** Lesson 6, Building Number Concepts (151-154) **Unit 4:** Lesson 9, Building Number Concepts (468-470); Lesson 9, Problem Solving (471-472); Lesson 10, Building Number Concepts (475-477)	
5.1.3.4 Solve real-world and mathematical problems requiring addition and subtraction of decimals, fractions and mixed numbers, including those involving measurement, geometry and data.		**Unit 2:** Lesson 6, Problem Solving (155-157); Lesson 8, Problem Solving (175-177); Lesson 9, Problem Solving (185-186); Lesson 11, Problem Solving (202-204); Lesson 12, Problem Solving (211-212); Lesson 13, Problem Solving (220-221); Lesson 14, Problem Solving (228-229); Lesson 15, Problem Solving (240-243) **Unit 3:** Lesson 14, Problem Solving (372-374) **Unit 4:** Lesson 1, Problem Solving (402-403); Lesson 2, Problem Solving (412-413); Lesson 6, Problem Solving (449-450); Lesson 9, Problem Solving (471-472) **Unit 6:** Lesson 14, Building Number Concepts (740-744); Lesson 15, Building Number Concepts (747-751)	
Algebra: Recognize and represent patterns of change; use patterns, tables, graphs and rules to solve real-world and mathematical problems.	**Unit 6:** Lesson 10, Building Number Concepts (722-726); Lesson 7, Building Number Concepts (696-699); Lesson 8, Building Number Concepts (706-		

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	708); Lesson 9, Building Number Concepts (714-717) **Unit 7:** Lesson 1, Building Number Concepts (743-746); Lesson 10, Building Number Concepts (815-820)		
5.2.1.1 Create and use rules, tables, spreadsheets and graphs to describe patterns of change and solve problems.			**Unit 2:** Lesson 1, Problem Solving (175-177); Lesson 2, Problem Solving (186-189); Lesson 3, Problem Solving (197-198)
5.2.1.2 Use a rule or table to represent ordered pairs of positive integers and graph these ordered pairs on a coordinate system.			
Algebra: Use properties of arithmetic to generate equivalent numerical expressions and evaluate expressions involving whole numbers.			**Unit 2:** Lesson 1, Building Number Concepts (171-174)
5.2.2.1 Apply the commutative, associative and distributive properties and order of operations to generate equivalent numerical expressions and to solve problems involving whole numbers.			**Unit 2:** Lesson 2, Building Number Concepts (181-185)
Algebra: Understand and interpret equations and inequalities involving variables and whole numbers, and use them to represent and solve real-world and mathematical problems.			
5.2.3.1 Determine whether an equation or inequality involving a variable is true or false for a given value of the variable.			
5.2.3.2 Represent real-world situations using equations and inequalities involving variables. Create real-world situations corresponding to equations and inequalities.			
5.2.3.3 Evaluate expressions and solve equations involving variables when values for the variables are given.			
Geometry & Measurement: Describe, classify, and draw representations of three-dimensional figures.			
5.3.1.1 Describe and classify three-dimensional figures including cubes, prisms and pyramids by the number of edges, faces or vertices as well as the types of faces.			**Unit 5:** Lesson 1, Problem Solving (546-550); Lesson 2, Problem Solving (556-558); Lesson 3, Problem Solving (565-567); Lesson 8, Problem Solving (613-614)
5.3.1.2 Recognize and draw a net for a three-dimensional figure.			**Unit 5:** Lesson 1, Problem Solving (546-550); Lesson 2, Problem Solving (556-558); Lesson 3, Problem Solving (565-567); Lesson 8, Problem Solving (613-614)
Geometry & Measurement: Determine the area of triangles and quadrilaterals; determine the surface			

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area and volume of rectangular prisms in various contexts.			
5.3.2.1 Develop and use formulas to determine the area of triangles, parallelograms and figures that can be decomposed into triangles.	**Unit 5:** Lesson 3, Problem Solving (533-535); Lesson 4, Problem Solving (542-543)	**Unit 6:** Lesson 1, Problem Solving (644-646); Lesson 2, Problem Solving (653-654); Lesson 4, Problem Solving (663-666); Lesson 5, Problem Solving (669-673); Lesson 6, Problem Solving (682-684); Lesson 15, Problem Solving (752-757)	
5.3.2.2 Use various tools and strategies to measure the volume and surface area of objects that are shaped like rectangular prisms.			**Unit 6:** Lesson 1, Problem Solving (651-653); Lesson 2, Problem Solving (656-661); Lesson 3, Problem Solving (671-675); Lesson 9, Problem Solving (717-724)
5.3.2.3 Understand that the volume of a three-dimensional figure can be found by counting the total number of same-sized cubic units that fill a shape without gaps or overlaps. Use cubic units to label volume measurements.			**Unit 6:** Lesson 1, Problem Solving (651-653); Lesson 2, Problem Solving (656-661); Lesson 3, Problem Solving (671-675); Lesson 9, Problem Solving (717-724)
5.3.2.4 Develop and use the formulas $V = \ell wh$ and $V = Bh$ to determine the volume of rectangular prisms. Justify why base area B and height h are multiplied to find the volume of a rectangular prism by breaking the prism into layers of unit cubes.			**Unit 6:** Lesson 3, Problem Solving (671-675); Lesson 9, Problem Solving (717-724)
Data Analysis: Display and interpret data; determine mean, median and range.			
5.4.1.1 Know and use the definitions of the mean, median and range of a set of data. Know how to use a spreadsheet to find the mean, median and range of a data set. Understand that the mean is a "leveling out" of data.	**Unit 8:** Lesson 1, Problem Solving (842-844); Lesson 2, Problem Solving (850-851); Lesson 3, Problem Solving (858-861); Lesson 4, Problem Solving (869-871); Lesson 5, Problem Solving (874-876); Lesson 6, Problem Solving (885-887); Lesson 7, Problem Solving (893-894); Lesson 11, Problem Solving (923-925); Lesson 12, Problem Solving (932-933); Lesson 14, Problem Solving (946-947); Lesson 15, Problem Solving (955-958)		**Unit 1:** Lesson 1, Problem Solving (14-17); Lesson 3, Problem Solving (33-38); Lesson 15, Problem Solving (153-159)
5.4.1.2 Create and analyze double-bar graphs and line graphs by applying understanding of whole numbers, fractions and decimals. Know how to create spreadsheet tables and graphs to display data.	**Unit 8:** Lesson 8, Problem Solving (900-902); Lesson 9, Problem Solving (908-910); Lesson 11, Problem Solving (923-925); Lesson 12, Problem Solving (932-933); Lesson 14, Problem Solving (946-947); Lesson 15, Problem Solving (955-958)		

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Grade 6			
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.		**Unit 8:** Lesson 8, Problem Solving (923-925)	
6.1.1.2 Compare positive rational numbers represented in various forms. Use the symbols <, = and >.		**Unit 7:** Lesson 3, Building Number Concepts (790-792); Lesson 5, Building Number Concepts (810-814)	
6.1.1.3 Understand that percent represents parts out of 100 and ratios to 100.		**Unit 7:** Lesson 1, Building Number Concepts (769-772); Lesson 2, Building Number Concepts (780-782); Lesson 3, Building Number Concepts (790-792); Lesson 5, Building Number Concepts (810-814); Lesson 10, Building Number Concepts (844-847)	**Unit 4:** Lesson 1, Problem Solving (433-435); Lesson 2, Building Number Concepts (439-440); Lesson 2, Problem Solving (441-445); Lesson 3, Problem Solving (453-456); Lesson 4, Problem Solving (464-467); Lesson 6, Problem Solving (484-486); Lesson 7, Problem Solving (492-495); Lesson 8, Problem Solving (502-505); Lesson 9, Problem Solving (511-514); Lesson 10, Problem Solving (524-529)
6.1.1.4 Determine equivalences among fractions, decimals and percents; select among these representations to solve problems.		**Unit 7:** Lesson 1, Building Number Concepts (769-772); Lesson 2, Building Number Concepts (780-782); Lesson 3, Building Number Concepts (790-792); Lesson 5, Building Number Concepts (810-814); Lesson 10, Building Number Concepts (844-847)	
6.1.1.5 Factor whole numbers; express a whole number as a product of prime factors with exponents.	**Unit 7:** Lesson 2, Building Number Concepts (752-755)	**Unit 9:** Lesson 9, Building Number Concepts (1062-1065)	
6.1.1.6 Determine greatest common factors and least common multiples. Use common factors and common multiples to calculate with fractions and find equivalent fractions.	**Unit 7:** Lesson 5, Building Number Concepts (775-777); Lesson 6, Building Number Concepts (782-784); Lesson 8, Building Number Concepts (796-798); Lesson 9, Building Number Concepts (806-809); Lesson 10, Building Number Concepts (815-820)	**Unit 2:** Lesson 8, Building Number Concepts (169-174); Lesson 9, Building Number Concepts (180-184); Lesson 10, Building Number Concepts (189-193); Lesson 11, Building Number Concepts (198-201); Lesson 12, Building Number Concepts (207-210); Lesson 13, Building Number Concepts (215-219); Lesson 14, Building Number Concepts (224-227); Lesson 15, Building Number Concepts (232-239); Lesson 15, Problem Solving (240-243) **Unit 3:** Lesson 5, Building Number Concepts (288-292); Lesson 7, Building Number Concepts (307-310)	
6.1.1.7 Convert between equivalent representations of positive rational numbers.			
Number & Operation: Understand the concept of			

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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; at comparing quantities using ratios is not the same as comparing quantities using subtraction.			**Unit 2:** Lesson 3, Building Number Concepts (193-196); Lesson 13, Building Number Concepts (284-285)
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.			**Unit 2:** Lesson 3, Problem Solving (197-198) **Unit 4:** Lesson 1, Problem Solving (433-435); Lesson 2, Building Number Concepts (439-440); Lesson 2, Problem Solving (441-445); Lesson 3, Problem Solving (453-456); Lesson 4, Problem Solving (464-467); Lesson 6, Problem Solving (484-486); Lesson 7, Problem Solving (492-495); Lesson 8, Problem Solving (502-505); Lesson 9, Problem Solving (511-514); Lesson 10, Problem Solving (524-529)
6.1.2.3 Determine the rate for ratios of quantities with different units.			**Unit 3:** Lesson 1, Problem Solving (331-335); Lesson 2, Problem Solving (342-344); Lesson 4, Problem Solving (358-361); Lesson 6, Problem Solving (374-380); Lesson 8, Problem Solving (392-396); Lesson 10, Problem Solving (414-417)
6.1.2.4 Use reasoning about multiplication and division to solve ratio and rate problems.			**Unit 3:** Lesson 1, Problem Solving (331-335); Lesson 2, Problem Solving (342-344); Lesson 4, Problem Solving (358-361); Lesson 6, Problem Solving (374-380); Lesson 8, Problem Solving (392-396); Lesson 10, Problem Solving (414-417)
Number & Operation: 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.		**Unit 3:** Lesson 1, Building Number Concepts (255-259); Lesson 2, Building Number Concepts (265-267); Lesson 3, Building Number Concepts (272-275); Lesson 3, Problem Solving (276-277); Lesson 4, Building Number Concepts (280-282); Lesson 5, Building Number Concepts (288-292); Lesson 7, Building Number Concepts (307-310); Lesson 8, Building Number Concepts (317-321); Lesson 9, Building Number Concepts (326-330); Lesson 9, Problem Solving (331-332); Lesson 10, Building Number Concepts (335-337); Lesson 11, Building Number Concepts (342-345); Lesson 11, Problem Solving (346-347); Lesson 13, Building Number Concepts (360-364); Lesson 14, Building Number Concepts (369-371); Lesson 14, Problem Solving (372-374); Lesson 15, Building Number Concepts	**Unit 1:** Lesson 3, Building Number Concepts (30-32); Lesson 4, Building Number Concepts (41-44); Lesson 5, Building Number Concepts (52-55); Lesson 6, Building Number Concepts (60-63); Lesson 11, Building Number Concepts (112-114); Lesson 12, Building Number Concepts (120-123); Lesson 13, Building Number Concepts (128-131); Lesson 14, Building Number Concepts (138-140); Lesson 15, Building Number Concepts (145-152)

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		(376-381) **Unit 4:** Lesson 6, Building Number Concepts (445-448); Lesson 7, Building Number Concepts (453-456); Lesson 8, Building Number Concepts (462-463); Lesson 9, Problem Solving (471-472); Lesson 10, Building Number Concepts (475-477) **Unit 6:** Lesson 6, Building Number Concepts (678-681); Lesson 7, Building Number Concepts (687-689); Lesson 8, Building Number Concepts (692-694); Lesson 11, Building Number Concepts (716-719); Lesson 12, Building Number Concepts (725-727); Lesson 13, Building Number Concepts (733-735); Lesson 14, Building Number Concepts (740-744); Lesson 15, Building Number Concepts (747-751)	
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.		**Unit 3:** Lesson 1, Building Number Concepts (255-259); Lesson 2, Building Number Concepts (265-267); Lesson 3, Building Number Concepts (272-275); Lesson 4, Building Number Concepts (280-282); Lesson 5, Building Number Concepts (288-292); Lesson 7, Building Number Concepts (307-310); Lesson 8, Building Number Concepts (317-321); Lesson 9, Building Number Concepts (326-330) **Unit 4:** Lesson 6, Building Number Concepts (445-448); Lesson 7, Building Number Concepts (453-456); Lesson 8, Building Number Concepts (462-463); Lesson 10, Building Number Concepts (475-477)	**Unit 1:** Lesson 3, Building Number Concepts (30-32); Lesson 4, Building Number Concepts (41-44); Lesson 5, Building Number Concepts (52-55); Lesson 6, Building Number Concepts (60-63)
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.			
6.1.3.4 Solve real-world and mathematical problems requiring arithmetic with decimals, fractions and mixed numbers.		**Unit 3:** Lesson 3, Problem Solving (276-277); Lesson 9, Problem Solving (331-332); Lesson 11, Problem Solving (346-347); Lesson 14, Problem Solving (372-374) **Unit 6:** Lesson 13, Problem Solving (736-737); Lesson 14, Building Number Concepts (740-744); Lesson 15, Building Number Concepts (747-751)	**Unit 1:** Lesson 14, Problem Solving (141-142)
6.1.3.5 Estimate solutions to problems with whole numbers, fractions and decimals and use the estimates to assess the reasonableness of results in the context of the problem.		**Unit 4:** Lesson 9, Building Number Concepts (468-470); Lesson 9, Problem Solving (471-472); Lesson 10, Building Number Concepts (475-477)	
Algebra: Recognize and represent relationships between varying quantities; translate from one			

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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.			**Unit 2:** Lesson 1, Building Number Concepts (171-174); Lesson 2, Building Number Concepts (181-185); Lesson 6, Building Number Concepts (218-220); Lesson 15, Building Number Concepts (301-307) **Unit 4:** Lesson 1, Building Number Concepts (429-432); Lesson 3, Building Number Concepts (448-452); Lesson 4, Building Number Concepts (460-463); Lesson 5, Building Number Concepts (471-475); Lesson 6, Building Number Concepts (480-483); Lesson 7, Building Number Concepts (489-491); Lesson 8, Building Number Concepts (498-501); Lesson 9, Building Number Concepts (508-510); Lesson 10, Building Number Concepts (518-523)
6.2.1.2 Represent the relationship between two varying quantities with function rules, graphs and tables; translate between any two of these representations.			**Unit 2:** Lesson 2, Problem Solving (186-189); Lesson 3, Problem Solving (197-198) **Unit 4:** Lesson 6, Building Number Concepts (480-483); Lesson 7, Building Number Concepts (489-491); Lesson 8, Building Number Concepts (498-501); Lesson 9, Building Number Concepts (508-510); Lesson 10, Building Number Concepts (518-523)
Algebra: 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.			**Unit 2:** Lesson 2, Building Number Concepts (181-185); Lesson 1, Building Number Concepts (541-545); Lesson 2, Building Number Concepts (553-555); Lesson 3, Building Number Concepts (561-564); Lesson 4, Building Number Concepts (570-575); Lesson 7, Building Number Concepts (597-601); Lesson 8, Building Number Concepts (608-612); Lesson 10, Building Number Concepts (622-627)
Algebra: 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.			

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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.			**Unit 2:** Lesson 1, Building Number Concepts (171-174); Lesson 4, Building Number Concepts (202-205); Lesson 5, Building Number Concepts (211-213); Lesson 15, Building Number Concepts (301-307) **Unit 7:** Lesson 1, Building Number Concepts (751-754); Lesson 2, Building Number Concepts (763-765); Lesson 3, Building Number Concepts (772-777); Lesson 4, Building Number Concepts (780-785); Lesson 6, Building Number Concepts (801-804); Lesson 7, Building Number Concepts (811-815); Lesson 8, Building Number Concepts (822-825); Lesson 9, Building Number Concepts (831-833); Lesson 10, Building Number Concepts (839-843)
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.			**Unit 5:** Lesson 5, Problem Solving (578-583); Lesson 7, Problem Solving (602-605.); Lesson 9, Problem Solving (617-619); Lesson 10, Problem Solving (628-632) **Unit 6:** Lesson 2, Problem Solving (656-661); Lesson 3, Problem Solving (671-675); Lesson 9, Problem Solving (717-724)
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.	**Unit 5:** Lesson 3, Problem Solving (533-535); Lesson 4, Problem Solving (542-543); Lesson 15, Problem Solving (629-632)	**Unit 6:** Lesson 15, Problem Solving (752-757)	
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.	**Unit 5:** Lesson 7, Problem Solving (568-569)		
Geometry & Measurement: 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.		**Unit 3:** Lesson 8, Problem Solving (322-324); Lesson 12, Problem Solving (355-357)	**Unit 7:** Lesson 2, Problem Solving (766-769); Lesson 4, Problem Solving (786-790); Lesson 5, Problem Solving (793-796); Lesson 6, Problem Solving (805-808); Lesson 7, Problem Solving (816-819); Lesson 8, Problem Solving (826-828); Lesson 9, Problem Solving (834-836); Lesson 10, Problem Solving (844-851)
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		**Unit 3:** Lesson 12, Problem Solving (355-357)	**Unit 7:** Lesson 1, Problem Solving (755-760); Lesson 2, Problem Solving (766-769); Lesson 4, Problem Solving (786-790); Lesson 5, Problem Solving (793-

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illustrate this fact.			796); Lesson 6, Problem Solving (805-808); Lesson 7, Problem Solving (816-819); Lesson 8, Problem Solving (826-828); Lesson 9, Problem Solving (834-836); Lesson 10, Problem Solving (844-851)
6.3.2.3 Develop and use formulas for the sums of the interior angles of polygons by decomposing them into triangles.		**Unit 3:** Lesson 12, Building Number Concepts (350-354); Lesson 13, Problem Solving (365-366); Lesson 15, Problem Solving (382-385) **Unit 6:** Lesson 8, Problem Solving (695-697)	**Unit 7:** Lesson 9, Problem Solving (834-836); Lesson 10, Problem Solving (844-851)
Geometry & Measurement: 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.	**Unit 9:** Lesson 1, Problem Solving (976-978); Lesson 2, Problem Solving (985-986); Lesson 3, Problem Solving (991-994); Lesson 4, Problem Solving (1001-1002); Lesson 9, Problem Solving (1036-1038); Lesson 10, Problem Solving (1045-1047)		
6.3.3.2 Estimate weights, capacities and geometric measurements using benchmarks in measurement systems with appropriate units.			
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.		**Unit 7:** Lesson 2, Problem Solving (783-787); Lesson 3, Problem Solving (793-797); Lesson 4, Building Number Concepts (800-804); Lesson 7, Building Number Concepts (825-828); Lesson 10, Problem Solving (848-851)	
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.		**Unit 7:** Lesson 1, Problem Solving (773-777); Lesson 4, Building Number Concepts (800-804); Lesson 4, Problem Solving (805-807); Lesson 6, Problem Solving (819-822); Lesson 7, Building Number Concepts (825-828); Lesson 7, Problem Solving (829-831); Lesson 8, Problem Solving (834-836); Lesson 9, Problem Solving (839-841); Lesson 10, Problem Solving (848-851)	
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.		**Unit 7:** Lesson 7, Building Number Concepts (825-828); Lesson 8, Problem Solving (834-836)	
6.4.1.4 Calculate experimental probabilities from		**Unit 7:** Lesson 4, Building Number Concepts (800-	

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experiments; represent them as percents, fractions and decimals between 0 and 1 inclusive. Use experimental probabilities to make predictions when actual probabilities are unknown.		804); Lesson 7, Building Number Concepts (825-828); Lesson 7, Problem Solving (829-831); Lesson 8, Problem Solving (834-836); Lesson 9, Problem Solving (839-841); Lesson 10, Problem Solving (848-851)	

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Grade 7			
Number & Operation: Read, write, represent and compare positive and negative rational numbers, expressed as integers, fractions and decimals.			
7.1.1.1 Know that every rational number can be written as the ratio of two integers or as a terminating or repeating decimal. Recognize that π is not rational, but that it can be approximated by rational numbers such as 22/7 and 3.14.			
7.1.1.2 Understand that division of two integers will always result in a rational number. Use this information to interpret the decimal result of a division problem when using a calculator.			
7.1.1.3 Locate positive and negative rational numbers on a number line, understand the concept of opposites, and plot pairs of positive and negative rational numbers on a coordinate grid.		**Unit 8:** Lesson 1, Building Number Concepts (863-865); Lesson 2, Building Number Concepts (870-875); Lesson 3, Building Number Concepts (878-881); Lesson 3, Problem Solving (882-883); Lesson 4, Building Number Concepts (886-888); Lesson 10, Problem Solving (934-939); Lesson 11, Problem Solving (944-950); Lesson 12, Problem Solving (953-956); Lesson 15, Building Number Concepts (974-982); Lesson 15, Problem Solving (983-987) **Unit 9:** Lesson 1, Problem Solving (1004-1006); Lesson 2, Problem Solving (1014-1016); Lesson 3, Problem Solving (1019-1023); Lesson 4, Problem Solving (1031-1032); Lesson 5, Problem Solving (1035-1038); Lesson 7, Problem Solving (1050-1053); Lesson 8, Problem Solving (1056-1059); Lesson 10, Problem Solving (1071-1076)	**Unit 9:** Lesson 1, Problem Solving (1013-1015); Lesson 2, Problem Solving (1022-1024); Lesson 3, Problem Solving (1032-1034)
7.1.1.4 Compare positive and negative rational numbers expressed in various forms using the symbols <, >, =, ≤, ≥.		**Unit 8:** Lesson 4, Building Number Concepts (886-888); Lesson 15, Building Number Concepts (974-982)	
7.1.1.5 Recognize and generate equivalent representations of positive and negative rational			

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numbers, including equivalent fractions.			
Number & Operation: Calculate with positive and negative rational numbers, and rational numbers with whole number exponents, to solve real-world and mathematical problems.			
7.1.2.1 Add, subtract, multiply and divide positive and negative rational numbers that are integers, fractions and terminating decimals; use efficient and generalizable procedures, including standard algorithms; raise positive rational numbers to whole-number exponents.		**Unit 8:** Lesson 5, Building Number Concepts (895-899); Lesson 6, Building Number Concepts (904-907); Lesson 7, Building Number Concepts (913-916); Lesson 8, Building Number Concepts (919-922); Lesson 9, Building Number Concepts (928-931); Lesson 13, Building Number Concepts (959-964); Lesson 14, Building Number Concepts (967-971); Lesson 15, Building Number Concepts (974-982) **Unit 9:** Lesson 1, Building Number Concepts (999-1003); Lesson 2, Building Number Concepts (1009-1013); Lesson 4, Building Number Concepts (1026-1030); Lesson 6, Building Number Concepts (1043-1047); Lesson 10, Building Number Concepts (1068-1070)	
7.1.2.2 Use real-world contexts and the inverse relationship between addition and subtraction to explain why the procedures of arithmetic with negative rational numbers make sense.		**Unit 8:** Lesson 5, Building Number Concepts (895-899); Lesson 6, Building Number Concepts (904-907); Lesson 7, Building Number Concepts (913-916); Lesson 8, Building Number Concepts (919-922); Lesson 14, Building Number Concepts (967-971); Lesson 15, Building Number Concepts (974-982)	
7.1.2.3 Understand that calculators and other computing technologies often truncate or round numbers.			
7.1.2.4 Solve problems in various contexts involving calculations with positive and negative rational numbers and positive integer exponents, including computing simple and compound interest.		**Unit 8:** Lesson 14, Building Number Concepts (967-971); Lesson 15, Building Number Concepts (974-982)	
7.1.2.5 Use proportional reasoning to solve problems involving ratios in various contexts.			**Unit 4:** Lesson 1, Problem Solving (433-435); Lesson 2, Building Number Concepts (439-440); Lesson 2, Problem Solving (441-445); Lesson 3, Problem Solving (453-456); Lesson 4, Problem Solving (464-467); Lesson 6, Problem Solving (484-486); Lesson 7, Problem Solving (492-495); Lesson 8, Problem Solving (502-505); Lesson 9, Problem Solving (511-514); Lesson 10, Problem Solving (524-529)
7.1.2.6 Demonstrate an understanding of the relationship between the absolute value of a rational			

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number and distance on a number line. Use the symbol for absolute value.			
Algebra: Understand the concept of proportionality in real-world and mathematical situations, and distinguish between proportional and other relationships.			
7.2.1.1 Understand that a relationship between two variables, *x* and *y*, is proportional if it can be expressed in the form $y/x = k$ or $y = kx$. Distinguish proportional relationships from other relationships, including inversely proportional relationships ($xy = k$ or $y = k/x$).			**Unit 2:** Lesson 4, Problem Solving (206-208)
7.2.1.2 Understand that the graph of a proportional relationship is a line through the origin whose slope is the unit rate (constant of proportionality). Know how to use graphing technology to examine what happens to a line when the unit rate is changed.			
Algebra: Recognize proportional relationships in real-world and mathematical situations; represent these and other relationships with tables, verbal descriptions, symbols and graphs; solve problems involving proportional relationships and explain results in the original context.			
7.2.2.1 Represent proportional relationships with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. Determine the unit rate (constant of proportionality or slope) given any of these representations.			**Unit 2:** Lesson 7, Building Number Concepts (227-229) **Unit 3:** Lesson 6, Problem Solving (374-380); Lesson 8, Problem Solving (392-396); Lesson 10, Problem Solving (414-417)
7.2.2.2 Solve multi-step problems involving proportional relationships in numerous contexts.			**Unit 2:** Lesson 4, Problem Solving (206-208); Lesson 6, Problem Solving (221-224); Lesson 7, Building Number Concepts (227-229); Lesson 7, Problem Solving (232-231); Lesson 8, Problem Solving (238-240); Lesson 9, Problem Solving (249-250); Lesson 10, Problem Solving (254-256); Lesson 11, Problem Solving (268-270); Lesson 12, Problem Solving (278-280); Lesson 13, Problem Solving (286-289); Lesson 14, Problem Solving (297-298); Lesson 15, Problem Solving (308-313) **Unit 3:** Lesson 6, Problem Solving (374-380) **Unit 4:** Lesson 2, Problem Solving (441-445); Lesson 3, Problem Solving (453-456); Lesson 4, Problem Solving (464-467); Lesson 6, Problem Solving (484-486); Lesson 7, Problem Solving (492-495); Lesson 8, Problem Solving (502-505); Lesson 9, Problem Solving (511-514); Lesson 10, Problem Solving (524-

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			529)
7.2.2.3 Use knowledge of proportions to assess the reasonableness of solutions.			
7.2.2.4 Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers.			**Unit 3:** Lesson 1, Building Number Concepts (325-330); Lesson 2, Building Number Concepts (339-341); Lesson 3, Building Number Concepts (348-351); Lesson 4, Building Number Concepts (355-357); Lesson 5, Building Number Concepts (365-369); Lesson 7, Building Number Concepts (383-386); Lesson 7, Problem Solving (387-389); Lesson 9, Building Number Concepts (400-402); Lesson 9, Problem Solving (403-404); Lesson 10, Building Number Concepts (408-413)
Algebra: Apply understanding of order of operations and algebraic properties to generate equivalent numerical and algebraic expressions containing positive and negative rational numbers and grouping symbols; evaluate such expressions.			
7.2.3.1 Use properties of algebra to generate equivalent numerical and algebraic expressions containing rational numbers, grouping symbols and whole number exponents. Properties of algebra include associative, commutative and distributive laws.			**Unit 5:** Lesson 3, Building Number Concepts (561-564); Lesson 4, Building Number Concepts (570-575); Lesson 6, Building Number Concepts (588-594); Lesson 7, Building Number Concepts (597-601); Lesson 8, Building Number Concepts (608-612); Lesson 10, Building Number Concepts (622-627) **Unit 6:** Lesson 7, Building Number Concepts (703-709); Lesson 10, Building Number Concepts (728-732)
7.2.3.2 Evaluate algebraic expressions containing rational numbers and whole number exponents at specified values of their variables.			**Unit 6:** Lesson 1, Building Number Concepts (643-650); Lesson 3, Building Number Concepts (664-670); Lesson 4, Building Number Concepts (678-683); Lesson 5, Building Number Concepts (686-689); Lesson 7, Building Number Concepts (703-709); Lesson 10, Building Number Concepts (728-732)
7.2.3.3 Apply understanding of order of operations and grouping symbols when using calculators and other technologies.			
Algebra: Represent real-world and mathematical situations using equations with variables. Solve equations symbolically, using the properties of equality. Also solve equations graphically and numerically. Interpret solutions in the original			

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context.			
7.2.4.1 Represent relationships in various contexts with equations involving variables and positive and negative rational numbers. Use the properties of equality to solve for the value of a variable. Interpret the solution in the original context.			**Unit 2:** Lesson 8, Building Number Concepts (234-237); Lesson 9, Building Number Concepts (244-248); Lesson 11, Building Number Concepts (262-267); Lesson 12, Building Number Concepts (274-277); Lesson 14, Building Number Concepts (293-296); Lesson 15, Building Number Concepts (301-307) **Unit 7:** Lesson 4, Building Number Concepts (780-785); Lesson 6, Building Number Concepts (801-804); Lesson 7, Building Number Concepts (811-815); Lesson 8, Building Number Concepts (822-825); Lesson 9, Building Number Concepts (831-833); Lesson 10, Building Number Concepts (839-843) **Unit 8:** Lesson 1, Problem Solving (869-871); Lesson 2, Problem Solving (878-800); Lesson 3, Problem Solving (887-891); Lesson 4, Problem Solving (894-898); Lesson 5, Problem Solving (901-904); Lesson 6, Problem Solving (912-915); Lesson 7, Problem Solving (921-925); Lesson 8, Problem Solving (933-935); Lesson 9, Problem Solving (942-943); Lesson 10, Problem Solving (946-949); Lesson 11, Problem Solving (957-959); Lesson 12, Problem Solving (965-967); Lesson 13, Problem Solving (975-978); Lesson 14, Problem Solving (984-986); Lesson 15, Problem Solving (994-997)
7.2.4.2 Solve equations resulting from proportional relationships in various contexts.			
Geometry & Measurement: Use reasoning with proportions and ratios to determine measurements, justify formulas and solve real-world and mathematical problems involving circles and related geometric figures.			
7.3.1.1 Demonstrate an understanding of the proportional relationship between the diameter and circumference of a circle and that the unit rate (constant of proportionality) is π. Calculate the circumference and area of circles and sectors of circles to solve problems in various contexts.		**Unit 6:** Lesson 9, Problem Solving (700-704); Lesson 10, Problem Solving (707-711); Lesson 11, Problem Solving (720-722); Lesson 12, Problem Solving (728-730); Lesson 15, Problem Solving (752-757)	
7.3.1.2 Calculate the volume and surface area of cylinders and justify the formulas used.			**Unit 5:** Lesson 5, Problem Solving (578-583); Lesson 7, Problem Solving (602-605.); Lesson 9, Problem Solving (617-619); Lesson 10, Problem Solving (628-632)
Geometry & Measurement: Analyze the effect of change of scale, translations and reflections on the			

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attributes of two-dimensional figures.			
7.3.2.1 Describe the properties of similarity, compare geometric figures for similarity, and determine scale factors.	**Unit 6:** Lesson 7, Problem Solving (700-703); Lesson 8, Problem Solving (709-711); Lesson 9, Problem Solving (718-719); Lesson 10, Problem Solving (727-730)		**Unit 2:** Lesson 8, Problem Solving (238-240)
7.3.2.2 Apply scale factors, length ratios and area ratios to determine side lengths and areas of similar geometric figures.	**Unit 3:** Lesson 12, Problem Solving (341-343)		**Unit 2:** Lesson 9, Problem Solving (249-250)
7.3.2.3 Use proportions and ratios to solve problems involving scale drawings and conversions of measurement units.			
7.3.2.4 Graph and describe translations and reflections of figures on a coordinate grid and determine the coordinates of the vertices of the figure after the transformation.		**Unit 9:** Lesson 3, Problem Solving (1019-1023); Lesson 4, Problem Solving (1031-1032); Lesson 5, Problem Solving (1035-1038); Lesson 7, Problem Solving (1050-1053); Lesson 8, Problem Solving (1056-1059); Lesson 10, Problem Solving (1071-1076)	**Unit 9:** Lesson 2, Problem Solving (1022-1024); Lesson 3, Problem Solving (1032-1034)
Data Analysis & Probability: Use mean, median and range to draw conclusions about data and make predictions.	**Unit 8:** Lesson 15, Problem Solving (955-958)		
7.4.1.1 Design simple experiments and collect data. Determine mean, median and range for quantitative data and from data represented in a display. Use these quantities to draw conclusions about the data, compare different data sets, and make predictions.	**Unit 8:** Lesson 3, Problem Solving (858-861)		**Unit 1:** Lesson 1, Problem Solving (14-17); Lesson 3, Problem Solving (33-38)
7.4.1.2 Describe the impact that inserting or deleting a data point has on the mean and the median of a data set. Know how to create data displays using a spreadsheet to examine this impact.			
Data Analysis & Probability: Display and interpret data in a variety of ways, including circle graphs and histograms.	**Unit 8:** Lesson 12, Problem Solving (932-933); Lesson 14, Problem Solving (946-947); Lesson 15, Problem Solving (955-958)		
7.4.2.1 Use reasoning with proportions to display and interpret data in circle graphs (pie charts) and histograms. Choose the appropriate data display and know how to create the display using a spreadsheet or other graphing technology.			
Data Analysis & Probability: Calculate probabilities and reason about probabilities using proportions to solve real-world and mathematical problems.			
7.4.3.1 Use random numbers generated by a calculator or a spreadsheet or taken from a table to simulate situations involving randomness, make a histogram to display the results, and compare the			

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results to known probabilities.			
7.4.3.2 Calculate probability as a fraction of sample space or as a fraction of area. Express probabilities as percents, decimals and fractions.		**Unit 7:** Lesson 4, Problem Solving (805-807); Lesson 6, Problem Solving (819-822); Lesson 7, Problem Solving (829-831); Lesson 10, Problem Solving (848-851)	
7.4.3.3 Use proportional reasoning to draw conclusions about and predict relative frequencies of outcomes based on probabilities.			

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Grade 8			
Number & Operation: Read, write, compare, classify and represent real numbers, and use them to solve problems in various contexts.			
8.1.1.1 Classify real numbers as rational or irrational. Know that when a square root of a positive integer is not an integer, then it is irrational. Know that the sum of a rational number and an irrational number is irrational, and the product of a non-zero rational number and an irrational number is irrational.			
8.1.1.2 Compare real numbers; locate real numbers on a number line. Identify the square root of a positive integer as an integer, or if it is not an integer, locate it as a real number between two consecutive positive integers.			**Unit 10:** Lesson 5, Building Number Concepts (1195-1198); Lesson 9, Building Number Concepts (1229-1232); Lesson 10, Building Number Concepts (1235-1240)
8.1.1.3 Determine rational approximations for solutions to problems involving real numbers.			
8.1.1.4 Know and apply the properties of positive and negative integer exponents to generate equivalent numerical expressions.	**Unit 7:** Lesson 3, Building Number Concepts (760-762); Lesson 4, Building Number Concepts (767-769); Lesson 9, Building Number Concepts (806-809)		
8.1.1.5 Express approximations of very large and very small numbers using scientific notation; understand how calculators display numbers in scientific notation. Multiply and divide numbers expressed in scientific notation, express the answer in scientific notation, using the correct number of significant digits when physical measurements are involved.			
Algebra: Understand the concept of function in real-world and mathematical situations, and distinguish			

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between linear and nonlinear functions.			
8.2.1.1 Understand that a function is a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable. Use functional notation, such as *f(x)*, to represent such relationships.			**Unit 9:** Lesson 1, Building Number Concepts (1009-1012); Lesson 2, Building Number Concepts (1019-1021); Lesson 3, Building Number Concepts (1028-1031); Lesson 4, Building Number Concepts (1038-1041); Lesson 5, Building Number Concepts (1044-1048); Lesson 6, Building Number Concepts (1053-1055); Lesson 7, Building Number Concepts (1062-1065); Lesson 8, Building Number Concepts (1071-1074); Lesson 9, Building Number Concepts (1079-1082); Lesson 10, Building Number Concepts (1088-1093); Lesson 11, Building Number Concepts (1098-1100); Lesson 12, Building Number Concepts (1109-1111); Lesson 13, Building Number Concepts (1119-1120); Lesson 14, Building Number Concepts (1127-1132); Lesson 15, Building Number Concepts (1137-1141)
8.2.1.2 Use linear functions to represent relationships in which changing the input variable by some amount leads to a change in the output variable that is a constant times that amount.			
8.2.1.3 Understand that a function is linear if it can be expressed in the form $f(x) = mx + b$ or if its graph is a straight line.			**Unit 9:** Lesson 6, Problem Solving (1056-1059); Lesson 7, Problem Solving (1066-1067); Lesson 8, Problem Solving (1075-1076); Lesson 9, Problem Solving (1083-1085); Lesson 11, Building Number Concepts (1098-1100); Lesson 11, Problem Solving (1101-1105); Lesson 12, Building Number Concepts (1109-1111); Lesson 12, Problem Solving (1112-1116); Lesson 13, Building Number Concepts (1119-1120); Lesson 14, Building Number Concepts (1127-1132); Lesson 15, Building Number Concepts (1137-1141)
8.2.1.4 Understand that an arithmetic sequence is a linear function that can be expressed in the form $f(x) = mx + b$, where $x = 0, 1, 2, 3,...$			**Unit 9:** Lesson 11, Building Number Concepts (1098-1100); Lesson 12, Building Number Concepts (1109-1111); Lesson 13, Building Number Concepts (1119-1120); Lesson 14, Building Number Concepts (1127-1132); Lesson 15, Building Number Concepts (1137-1141)
8.2.1.5 Understand that a geometric sequence is a non-linear function that can be expressed in the form $f(x) = ab^x$, where $x = 0, 1, 2, 3,...$			
Algebra: Recognize linear functions in real-world and mathematical situations; represent linear functions and other functions with tables, verbal descriptions,			

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symbols and graphs; solve problems involving these functions and explain results in the original context.			
8.2.2.1 Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another.			**Unit 9:** Lesson 3, Building Number Concepts (1028-1031); Lesson 4, Building Number Concepts (1038-1041); Lesson 5, Building Number Concepts (1044-1048); Lesson 6, Building Number Concepts (1053-1055); Lesson 6, Problem Solving (1056-1059); Lesson 7, Building Number Concepts (1062-1065); Lesson 7, Problem Solving (1066-1067); Lesson 8, Building Number Concepts (1071-1074); Lesson 8, Problem Solving (1075-1076); Lesson 9, Building Number Concepts (1079-1082); Lesson 9, Problem Solving (1083-1085); Lesson 10, Building Number Concepts (1088-1093); Lesson 11, Building Number Concepts (1098-1100); Lesson 11, Problem Solving (1101-1105); Lesson 12, Building Number Concepts (1109-1111); Lesson 12, Problem Solving (1112-1116); Lesson 13, Building Number Concepts (1119-1120); Lesson 13, Problem Solving (1121-1123); Lesson 14, Building Number Concepts (1127-1132); Lesson 14, Problem Solving (1133-1134); Lesson 15, Building Number Concepts (1137-1141); Lesson 15, Problem Solving (1142-1148)
8.2.2.2 Identify graphical properties of linear functions including slopes and intercepts. Know that the slope equals the rate of change, and that the *y*-intercept is zero when the function represents a proportional relationship.			**Unit 9:** Lesson 7, Building Number Concepts (1062-1065); Lesson 7, Problem Solving (1066-1067); Lesson 8, Building Number Concepts (1071-1074); Lesson 8, Problem Solving (1075-1076); Lesson 9, Building Number Concepts (1079-1082); Lesson 9, Problem Solving (1083-1085); Lesson 10, Building Number Concepts (1088-1093); Lesson 11, Building Number Concepts (1098-1100); Lesson 11, Problem Solving (1101-1105); Lesson 12, Building Number Concepts (1109-1111); Lesson 12, Problem Solving (1112-1116); Lesson 13, Building Number Concepts (1119-1120); Lesson 13, Problem Solving (1121-1123); Lesson 14, Building Number Concepts (1127-1132); Lesson 14, Problem Solving (1133-1134); Lesson 15, Building Number Concepts (1137-1141); Lesson 15, Problem Solving (1142-1148)
8.2.2.3 Identify how coefficient changes in the equation $f(x) = mx + b$ affect the graphs of linear functions. Know how to use graphing technology to examine these effects.			**Unit 9:** Lesson 7, Problem Solving (1066-1067); Lesson 8, Problem Solving (1075-1076); Lesson 9, Problem Solving (1083-1085); Lesson 11, Problem Solving (1101-1105); Lesson 12, Problem Solving (1112-1116)
8.2.2.4 Represent arithmetic sequences using			**Unit 9:** Lesson 12, Problem Solving (1112-1116);

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equations, tables, graphs and verbal descriptions, and use them to solve problems.			Lesson 13, Problem Solving (1121-1123); Lesson 14, Problem Solving (1133-1134); Lesson 15, Problem Solving (1142-1148)
8.2.2.5 Represent geometric sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems.			
Algebra: Generate equivalent numerical and algebraic expressions and use algebraic properties to evaluate expressions.			
8.2.3.1 Evaluate algebraic expressions, including expressions containing radicals and absolute values, at specified values of their variables.			**Unit 10:** Lesson 7, Building Number Concepts (1211-1214)
8.2.3.2 Justify steps in generating equivalent expressions by identifying the properties used, including the properties of algebra. Properties include the associative, commutative and distributive laws, and the order of operations, including grouping symbols.			**Unit 5:** Lesson 4, Building Number Concepts (570-575); Lesson 6, Building Number Concepts (588-594); Lesson 7, Building Number Concepts (597-601); Lesson 8, Building Number Concepts (608-612); Lesson 10, Building Number Concepts (622-627) **Unit 10:** Lesson 7, Building Number Concepts (1211-1214)
Algebra: Represent real-world and mathematical situations using equations and inequalities involving linear expressions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.			
8.2.4.1 Use linear equations to represent situations involving a constant rate of change, including proportional and nonproportional relationships.			**Unit 9:** Lesson 8, Problem Solving (1075-1076); Lesson 9, Problem Solving (1083-1085); Lesson 12, Building Number Concepts (1109-1111); Lesson 12, Problem Solving (1112-1116); Lesson 13, Building Number Concepts (1119-1120); Lesson 13, Problem Solving (1121-1123); Lesson 14, Building Number Concepts (1127-1132); Lesson 14, Problem Solving (1133-1134); Lesson 15, Building Number Concepts (1137-1141); Lesson 15, Problem Solving (1142-1148)
8.2.4.2 Solve multi-step equations in one variable. Solve for one variable in a multi-variable equation in terms of the other variables. Justify the steps by identifying the properties of equalities used.			**Unit 7:** Lesson 8, Building Number Concepts (822-825); Lesson 9, Building Number Concepts (831-833); Lesson 10, Building Number Concepts (839-843) **Unit 8:** Lesson 1, Building Number Concepts (863-868); Lesson 1, Problem Solving (869-871); Lesson 2, Building Number Concepts (874-877); Lesson 2, Problem Solving (878-800); Lesson 3, Building Number Concepts (883-886); Lesson 3, Problem Solving (887-891); Lesson 4, Problem Solving (894-898); Lesson 5, Problem Solving (901-904); Lesson 6, Building Number Concepts (909-911); Lesson 6,

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			Problem Solving (912-915); Lesson 7, Building Number Concepts (918-920); Lesson 7, Problem Solving (921-925); Lesson 8, Building Number Concepts (928-932); Lesson 8, Problem Solving (933-935); Lesson 9, Building Number Concepts (938-941); Lesson 9, Problem Solving (942-943); Lesson 10, Problem Solving (946-949); Lesson 11, Building Number Concepts (954-956); Lesson 11, Problem Solving (957-959); Lesson 12, Building Number Concepts (962-964); Lesson 12, Problem Solving (965-967); Lesson 13, Building Number Concepts (970-974); Lesson 13, Problem Solving (975-978); Lesson 14, Building Number Concepts (981-983); Lesson 14, Problem Solving (984-986); Lesson 15, Building Number Concepts (989-993); Lesson 15, Problem Solving (994-997) **Unit 10:** Lesson 8, Building Number Concepts (1220-1222)
8.2.4.3 Express linear equations in slope-intercept, point-slope and standard forms, and convert between these forms. Given sufficient information, find an equation of a line.			**Unit 9:** Lesson 8, Problem Solving (1075-1076); Lesson 9, Problem Solving (1083-1085); Lesson 11, Problem Solving (1101-1105)
8.2.4.4 Use linear inequalities to represent relationships in various contexts.			**Unit 3:** Lesson 2, Building Number Concepts (339-341); Lesson 3, Building Number Concepts (348-351); Lesson 4, Building Number Concepts (355-357); Lesson 5, Building Number Concepts (365-369); Lesson 7, Building Number Concepts (383-386); Lesson 9, Building Number Concepts (400-402); Lesson 10, Building Number Concepts (408-413)
8.2.4.5 Solve linear inequalities using properties of inequalities. Graph the solutions on a number line.			**Unit 3:** Lesson 2, Building Number Concepts (339-341); Lesson 3, Building Number Concepts (348-351); Lesson 4, Building Number Concepts (355-357); Lesson 5, Building Number Concepts (365-369); Lesson 7, Building Number Concepts (383-386); Lesson 9, Building Number Concepts (400-402); Lesson 10, Building Number Concepts (408-413)
8.2.4.6 Represent relationships in various contexts with equations and inequalities involving the absolute value of a linear expression. Solve such equations and inequalities and graph the solutions on a number line.			
8.2.4.7 Represent relationships in various contexts using systems of linear equations. Solve systems of linear equations in two variables symbolically, graphically and numerically.			

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8.2.4.8 Understand that a system of linear equations may have no solution, one solution, or an infinite number of solutions. Relate the number of solutions to pairs of lines that are intersecting, parallel or identical. Check whether a pair of numbers satisfies a system of two linear equations in two unknowns by substituting the numbers into both equations.			**Unit 9:** Lesson 13, Problem Solving (1121-1123); Lesson 14, Problem Solving (1133-1134); Lesson 15, Problem Solving (1142-1148)
8.2.4.9 Use the relationship between square roots and squares of a number to solve problems.			**Unit 10:** Lesson 8, Building Number Concepts (1220-1222)
Geometry & Measurement: Solve problems involving right triangles using the Pythagorean Theorem and its converse.			
8.3.1.1 Use the Pythagorean Theorem to solve problems involving right triangles.			**Unit 10:** Lesson 1, Building Number Concepts (1159-1167); Lesson 2, Building Number Concepts (1170-1175); Lesson 3, Building Number Concepts (1178-1185); Lesson 10, Building Number Concepts (1235-1240)
8.3.1.2 Determine the distance between two points on a horizontal or vertical line in a coordinate system. Use the Pythagorean Theorem to find the distance between any two points in a coordinate system.			
8.3.1.3 Informally justify the Pythagorean Theorem by using measurements, diagrams and computer software.			**Unit 10:** Lesson 1, Building Number Concepts (1159-1167); Lesson 2, Building Number Concepts (1170-1175); Lesson 3, Building Number Concepts (1178-1185)
Geometry & Measurement: Solve problems involving parallel and perpendicular lines on a coordinate system.			
8.3.2.1 Understand and apply the relationships between the slopes of parallel lines and between the slopes of perpendicular lines. Dynamic graphing software may be used to examine these relationships.			
8.3.2.2 Analyze polygons on a coordinate system by determining the slopes of their sides.			
8.3.2.3 Given a line on a coordinate system and the coordinates of a point not on the line, find lines through that point that are parallel and perpendicular to the given line, symbolically and graphically.			
Data Analysis & Probability: Interpret data using scatterplots and approximate lines of best fit. Use lines of best fit to draw conclusions about data.			
8.4.1.1 Collect, display and interpret data using scatterplots. Use the shape of the scatterplot to informally estimate a line of best fit and determine an			**Unit 1:** Lesson 9, Problem Solving (98-101); Lesson 11, Problem Solving (115-117); Lesson 12, Problem Solving (124-125); Lesson 13, Problem Solving (132-

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equation for the line. Use appropriate titles, labels and units. Know how to use graphing technology to display scatterplots and corresponding lines of best fit.			135); Lesson 15, Problem Solving (153-159)
8.4.1.2 Use a line of best fit to make statements about approximate rate of change and to make predictions about values not in the original data set.			**Unit 1:** Lesson 13, Problem Solving (132-135); Lesson 15, Problem Solving (153-159)
8.4.1.3 Assess the reasonableness of predictions using scatterplots by interpreting them in the original context.			

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Grades 9 - 12			
Algebra: Understand the concept of function, and identify important features of functions and other relations using symbolic and graphical methods where appropriate.			
9.2.1.1 Understand the definition of a function. Use functional notation and evaluate a function at a given point in its domain.			**Unit 9:** Lesson 5, Building Number Concepts (1044-1048); Lesson 6, Building Number Concepts (1053-1055); Lesson 7, Building Number Concepts (1062-1065); Lesson 8, Building Number Concepts (1071-1074); Lesson 9, Building Number Concepts (1079-1082); Lesson 10, Building Number Concepts (1088-1093); Lesson 11, Building Number Concepts (1098-1100); Lesson 12, Building Number Concepts (1109-1111); Lesson 13, Building Number Concepts (1119-1120); Lesson 14, Building Number Concepts (1127-1132); Lesson 15, Building Number Concepts (1137-1141)
9.2.1.2 Distinguish between functions and other relations defined symbolically, graphically or in tabular form.			
9.2.1.3 Find the domain of a function defined symbolically, graphically or in a real-world context.			
9.2.1.4 Obtain information and draw conclusions from graphs of functions and other relations.			**Unit 9:** Lesson 4, Building Number Concepts (1038-1041); Lesson 7, Building Number Concepts (1062-1065); Lesson 8, Building Number Concepts (1071-1074); Lesson 9, Building Number Concepts (1079-1082); Lesson 10, Building Number Concepts (1088-1093); Lesson 11, Building Number Concepts (1098-1100); Lesson 12, Building Number Concepts (1109-

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			1111); Lesson 13, Building Number Concepts (1119-1120); Lesson 14, Building Number Concepts (1127-1132); Lesson 15, Building Number Concepts (1137-1141)
9.2.1.5 Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$, in the form $f(x) = a(x − h)^2 + k$, or in factored form.			
9.2.1.6 Identify intercepts, zeros, maxima, minima and intervals of increase and decrease from the graph of a function.			
9.2.1.7 Understand the concept of an asymptote and identify asymptotes for exponential functions and reciprocals of linear functions, using symbolic and graphical methods.			
9.2.1.8 Make qualitative statements about the rate of change of a function, based on its graph or table of values.			
9.2.1.9 Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations.			
Algebra: Recognize linear, quadratic, exponential and other common functions in real-world and mathematical situations; represent these functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions, and explain results in the original context.			
9.2.2.1 Represent and solve problems in various contexts using linear and quadratic functions.			**Unit 10:** Lesson 4, Problem Solving (1188-1192); Lesson 6, Problem Solving (1203-1208); Lesson 7, Problem Solving (1215-1217); Lesson 8, Problem Solving (1223-1226); Lesson 10, Problem Solving (1241-1247)
9.2.2.2 Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth.			**Unit 10:** Lesson 4, Problem Solving (1188-1192); Lesson 6, Problem Solving (1203-1208); Lesson 7, Problem Solving (1215-1217); Lesson 8, Problem Solving (1223-1226); Lesson 10, Problem Solving (1241-1247)
9.2.2.3 Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions.			

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9.2.2.4 Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively.			
9.2.2.5 Recognize and solve problems that can be modeled using finite geometric sequences and series, such as home mortgage and other compound interest examples. Know how to use spreadsheets and calculators to explore geometric sequences and series in various contexts.			
9.2.2.6 Sketch the graphs of common non-linear functions such as $f(x)= \sqrt{x}$, $f(x)=\|x\|$, $f(x) = 1/x$, $f(x) = x^3$, and translations of these functions, such as $f(x) = \sqrt{x-2}+4$. Know how to use graphing technology to graph these functions.			
Algebra: Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions.			
9.2.3.1 Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains.			
9.2.3.2 Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree.			
9.2.3.3 Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.			
9.2.3.4 Add, subtract, multiply, divide and simplify algebraic fractions.			
9.2.3.5 Check whether a given complex number is a solution of a quadratic equation by substituting it for the variable and evaluating the expression, using arithmetic with complex numbers.			
9.2.3.6 Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving n^{th} roots.			
9.2.3.7 Justify steps in generating equivalent expressions by identifying the properties used. Use substitution to check the equality of expressions for some particular values of the variables; recognize that checking with substitution does not guarantee equality of expressions for all values of the variables.			
Algebra: Represent real world and mathematical			

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situations using equations and inequalities involving linear, quadratic, exponential and n th root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.			
9.2.4.1 Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.			
9.2.4.2 Represent relationships in various contexts using equations involving exponential functions; solve these equations graphically or numerically. Know how to use calculators, graphing utilities or other technology to solve these equations.			
9.2.4.3 Recognize that to solve certain equations, number systems need to be extended from whole numbers to integers, from integers to rational numbers, from rational numbers to real numbers, and from real numbers to complex numbers. In particular, non-real complex numbers are needed to solve some quadratic equations with real coefficients.			
9.2.4.4 Represent relationships in various contexts using systems of linear inequalities; solve them graphically. Indicate which parts of the boundary are included in and excluded from the solution set using solid and dotted lines.			
9.2.4.5 Solve linear programming problems in two variables using graphical methods.			
9.2.4.6 Represent relationships in various contexts using absolute value inequalities in two variables; solve them graphically.			
9.2.4.7 Solve equations that contain radical expressions. Recognize that extraneous solutions may arise when using symbolic methods.			
9.2.4.8 Assess the reasonableness of a solution in its given context and compare the solution to appropriate graphical or numerical estimates; interpret a solution in the original context.			
Geometry & Measurement: Calculate measurements			

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of plane and solid geometric figures; know that physical measurements depend on the choice of a unit and that they are approximations.			
9.3.1.1 Determine the surface area and volume of pyramids, cones and spheres. Use measuring devices or formulas as appropriate.			**Unit 6:** Lesson 6, Problem Solving (694-700); Lesson 9, Problem Solving (717-724)
9.3.1.2 Compose and decompose two- and three-dimensional figures; use decomposition to determine the perimeter, area, surface area and volume of various figures.			**Unit 6:** Lesson 8, Problem Solving (712-714)
9.3.1.3 Understand that quantities associated with physical measurements must be assigned units; apply such units correctly in expressions, equations and problem solutions that involve measurements; and convert between measurement systems.			
9.3.1.4 Understand and apply the fact that the effect of a scale factor k on length, area and volume is to multiply each by k, k^2 and k^3, respectively.			
9.3.1.5 Make reasonable estimates and judgments about the accuracy of values resulting from calculations involving measurements.			
Geometry & Measurement: Construct logical arguments, based on axioms, definitions and theorems, to prove theorems and other results in geometry.			
9.3.2.1 Understand the roles of axioms, definitions, undefined terms and theorems in logical arguments.			
9.3.2.2 Accurately interpret and use words and phrases such as "if…then," "if and only if," "all," and "not." Recognize the logical relationships between an "if…then" statement and its inverse, converse and contrapositive.			
9.3.2.3 Assess the validity of a logical argument and give counterexamples to disprove a statement.			
9.3.2.4 Construct logical arguments and write proofs of theorems and other results in geometry, including proofs by contradiction. Express proofs in a form that clearly justifies the reasoning, such as two-column proofs, paragraph proofs, flow charts or illustrations.			
9.3.2.5 Use technology tools to examine theorems, make and test conjectures, perform constructions and develop mathematical reasoning skills in multi-step problems. The tools may include compass and straight edge, dynamic geometry software, design software or			

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Internet applets.			
Geometry & Measurement: Know and apply properties of geometric figures to solve real-world and mathematical problems and to logically justify results in geometry.			
9.3.3.1 Know and apply properties of parallel and perpendicular lines, including properties of angles formed by a transversal, to solve problems and logically justify results.			
9.3.3.2 Know and apply properties of angles, including corresponding, exterior, interior, vertical, complementary and supplementary angles, to solve problems and logically justify results.			
9.3.3.3 Know and apply properties of equilateral, isosceles and scalene triangles to solve problems and logically justify results.			
9.3.3.4 Apply the Pythagorean Theorem and its converse to solve problems and logically justify results.			
9.3.3.5 Know and apply properties of right triangles, including properties of 45-45-90 and 30-60-90 triangles, to solve problems and logically justify results.			
9.3.3.6 Know and apply properties of congruent and similar figures to solve problems and logically justify results.			
9.3.3.7 Use properties of polygons—including quadrilaterals and regular polygons—to define them, classify them, solve problems and logically justify results.			
9.3.3.8 Know and apply properties of a circle to solve problems and logically justify results			
Geometry & Measurement: Solve real-world and mathematical geometric problems using algebraic methods.			
9.3.4.1 Understand how the properties of similar right triangles allow the trigonometric ratios to be defined, and determine the sine, cosine and tangent of an acute angle in a right triangle.			
9.3.4.2 Apply the trigonometric ratios sine, cosine and tangent to solve problems, such as determining lengths and areas in right triangles and in figures that			

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can be decomposed into right triangles. Know how to use calculators, tables or other technology to evaluate trigonometric ratios.			
9.3.4.3 Use calculators, tables or other technologies in connection with the trigonometric ratios to find angle measures in right triangles in various contexts.			
9.3.4.4 Use coordinate geometry to represent and analyze line segments and polygons, including determining lengths, midpoints and slopes of line segments.			
9.3.4.5 Know the equation for the graph of a circle with radius r and center *(h, k), (x − h)^2 + (y − k)^2 = r^2,* and justify this equation using the Pythagorean Theorem and properties of translations.			
9.3.4.6 Use numeric, graphic and symbolic representations of transformations in two dimensions, such as reflections, translations, scale changes and rotations about the origin by multiples of 90˚, to solve problems involving figures on a coordinate grid.			
9.3.4.7 Use algebra to solve geometric problems unrelated to coordinate geometry, such as solving for an unknown length in a figure involving similar triangles, or using the Pythagorean Theorem to obtain a quadratic equation for a length in a geometric figure.			
Data Analysis & Probability: Display and analyze data; use various measures associated with data to draw conclusions, identify trends and describe relationships.			
9.4.1.1 Describe a data set using data displays, including box-and-whisker plots; describe and compare data sets using summary statistics, including measures of center, location and spread. Measures of center and location include mean, median, quartile and percentile. Measures of spread include standard deviation, range and inter-quartile range. Know how to use calculators, spreadsheets or other technology to display data and calculate summary statistics.			**Unit 1:** Lesson 6, Problem Solving (64-69); Lesson 7, Problem Solving (76-80); Lesson 8, Problem Solving (88-92); Lesson 15, Problem Solving (153-159)
9.4.1.2 Analyze the effects on summary statistics of changes in data sets.			
9.4.1.3 Use scatterplots to analyze patterns and describe relationships between two variables. Using technology, determine regression lines (line of best			

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fit) and correlation coefficients; use regression lines to make predictions and correlation coefficients to assess the reliability of those predictions.			
9.4.1.4 Use the mean and standard deviation of a data set to fit it to a normal distribution (bell-shaped curve) and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets and tables to estimate areas under the normal curve.			**Unit 1:** Lesson 4, Problem Solving (45-49)
Data Analysis & Probability: Explain the uses of data and statistical thinking to draw inferences, make predictions and justify conclusions.			
9.4.2.1 Evaluate reports based on data published in the media by identifying the source of the data, the design of the study, and the way the data are analyzed and displayed. Show how graphs and data can be distorted to support different points of view. Know how to use spreadsheet tables and graphs or graphing technology to recognize and analyze distortions in data displays.			
9.4.2.2 Identify and explain misleading uses of data; recognize when arguments based on data confuse correlation and causation.			
9.4.2.3 Design simple experiments and explain the impact of sampling methods, bias and the phrasing of questions asked during data collection.			
Data Analysis & Probability: Calculate probabilities and apply probability concepts to solve real-world and mathematical problems.			
9.4.3.1 Select and apply counting procedures, such as the multiplication and addition principles and tree diagrams, to determine the size of a sample space (the number of possible outcomes) and to calculate probabilities.			
9.4.3.2 Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes.			
9.4.3.3 Understand that the Law of Large Numbers expresses a relationship between the probabilities in a probability model and the experimental probabilities found by performing simulations or experiments involving the model.			
9.4.3.4 Use random numbers generated by a			

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calculator or a spreadsheet, or taken from a table, to perform probability simulations and to introduce fairness into decision making.			
9.4.3.5 Apply probability concepts such as intersections, unions and complements of events, and conditional probability and independence, to calculate probabilities and solve problems.			
9.4.3.6 Describe the concepts of intersections, unions and complements using Venn diagrams. Understand the relationships between these concepts and the words AND, OR, NOT, as used in computerized searches and spreadsheets			
9.4.3.7 Understand and use simple probability formulas involving intersections, unions and complements of events.			
9.4.3.8 Apply probability concepts to real-world situations to make informed decisions.			
9.4.3.9 Use the relationship between conditional probabilities and relative frequencies in contingency tables.			

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