

PROBLEM SOLVING EXPERIENCES ©2005

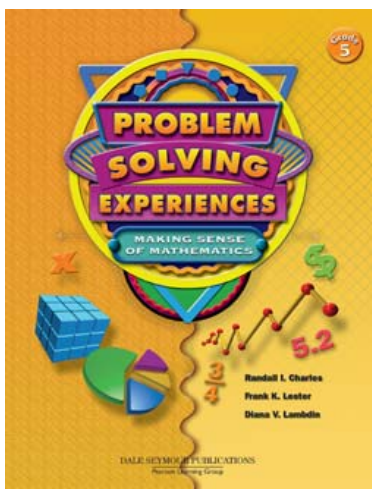


CONTENT ALIGNMENT GUIDE TO

SCOTT FORESMAN'S

INVESTIGATIONS IN NUMBER, DATA, AND SPACE[®] CURRICULUM

Grade 5



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**Mathematical Thinking at Grade 5
(Introduction, Landmarks in the Number System)**

Students are introduced to the methods and materials of the Investigations curriculum. They build an understanding of the factors and multiples of 10,000. They develop solutions to computations from their number sense and knowledge of the base ten system.

	Problem Solving Experiences corresponding problem #	Content Strands								
		Estimation	Number Sense and Numeration	Whole Number Operations	Whole Number Computation	Geometry and Spatial Sense	Measurement	Statistics and Probability	Fractions and Decimals	Patterns, Relations, and Functions
Mathematical Emphases										
Developing, discussing, and comparing strategies for solving problems about number relationships and computation	2, 3, 4, 15, 60, 84	1:2,5-7 3:2-4,5 4:1	1:1-2 3:2-4,5	1:1-2 3:2-4,5 4:1						
Reasoning about and describing number characteristics and relationships such as multiple, factor, even, odd, prime, and square	140	1:5-7 4:2,3,4	1:3-4, 5-7 4:2,3,4						1:3-4	
Representing factor pairs as dimensions of a rectangular array			1:3-4 2:2-4,5							
Exploring materials that will be used as problem-solving tools, including calculators		1:1-2 4:2,3,4	1:1-7 4:2,3,4	1:1-2 4:2,3,4						
Communicating mathematical thinking through written and spoken language	49, 86, 141, 144	1:1-2, 5-7 3:5 4:5-6	1:3-4, 5-7 2:2-4 3:5 4:5-6	1:1-2 3:5 4:5-6						
Solving problems with one solution, more than one solution, and no solutions	9, 101	1:5-7 4:2,3,4 4:5-6	1:5-7 4:2,3,4 4:5-6	4:2,3,4 4:5-6						
Using knowledge of landmarks up to 100 (including factors of multiples of them) to explore landmarks up to 1000, and using landmarks up to 1000 to explore landmarks up to 10,000	72	2:1,2-4 3:1,5 4:5-6	2:1,2-4 3:1,5 4:5-6	3:1 3:5	2:1,2-4 3:1,5					
Developing a variety of strategies for exploring number composition (e.g. repeated addition, skip counting, finding factors and factor pairs, using a calculator to check divisibility)	3, 10	2:1 3:5 4:5-6	2:1,2-4 3:5 4:5-6	2:1,2-4 3:5 4:5-6						
Reading, writing, and ordering numbers to 1000 and 10,000	42	2:5	2:5		2:5					
Developing a sense of the magnitude of 1000 and 10,000		2:2-4,5 4:5-6	2:5 4:5-6							
Becoming familiar with skip-counting patterns leading to 1000 (e.g. sequences of multiples of 25, 50, and 75) and 10,000 (multiples of 250, 500, 750)		2:1,2-4 3:1 4:5-6		2:1 3:1	2:1 3:1 4:5-6					
Becoming familiar with factors and factor pairs of 1000 and 10,000	102	2:2-4 3:1 4:5-6	2:2-4 3:1 4:5-6	2:2-4 3:1 4:5-6	4:5-6				2:2-4,5	
Using knowledge of landmarks up to 10,000 (including factors of 1000 and multiples of those factors) to solve puzzles and problems	67	4:2,3,4 5,6 3:1	3:1 4:2,3,4 5-6	3:1 4:2,3,4 5-6						

**Mathematical Thinking at Grade 5
(Introduction, Landmarks in the Number System)**
CONTINUED

	Problem Solving Experiences corresponding problem #	Content Strands								
		Estimation	Number Sense and Numeration	Whole Number Operations	Whole Number Computation	Geometry and Spatial Sense	Measurement	Statistics and Probability	Fractions and Decimals	Patterns, Relations, and Functions
Developing mental multiplication and division strategies that rely on landmarks up to 10,000		3:2-4	3:2-4	3:2-4						
Developing mental and written strategies for finding sums and differences of 3- and 4-digit numbers	7, 8, 18, 29, 38, 83	4:1,2, 3,4	4:1,2, 3,4	4:1,2, 3,4						
TMM--Interpreting posing questions about data, and using fractions to describe data							1:5-7 2:1 TMM			
TMM--Developing and analyzing concepts and language to reflect on and communicate about spatial relationships, shapes, patterns, and visual images	90, 115	3:1 TMM							3:1 4:1 TMM	

**Picturing Polygons
(2-D Geometry)**

Students describe and create polygons on paper, with plastic shapes, and with Geo-Logo. They investigate properties of triangles and quadrilaterals, and work with regularity and similarity.

	Problem Solving Experiences corresponding problem #	Content Strands								
		Number and Number Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement
Mathematical Emphases										
Distinguishing between polygons and nonpolygons and between regular and nonregular polygons	105				1:1 3:1-2				1:1-2 3:1-3	3:1-3
Recognizing and naming polygons by number of sides								1:2-4 2:1		
Locating points on a coordinate grid						1:3-4 2:4-5		1:3-4 2:4-5		
Generating geometric figures with certain properties (including in a geometry computer environment)	21, 150							1:3-4 2:4-7 3:1-2, 4-7	2:4-7 3:1-2	
Sorting and classifying triangles and quadrilaterals, and developing vocabulary to describe special cases	50, 51, 80, 125				2:1-3			1:2 2:1-5	2:1-5	
Developing an understanding of parallel lines								2:1-7		
Distinguishing and seeing relationships between turns and angles				2:9 3:3						
Using known angles to find the measures of others	135		2:8					2:1-3,8	2:8	
Estimating and measuring the sizes of angles and turns			3:3					2:1-3, 6-9 3:1-3	2:1-3, 6-9 3:1-3	
Finding the sizes and the sums of turns and angles in regular and nonregular polygons, and exploring the relationship to the total number of sides			3:1-3	3:1-3	3:1-3			3:1-3	3:1-3	
Writing computer procedures to draw regular polygons and figures that are similar to a given figure	35	3:5-7						3:1-2, 4-7	3:1-2	
Creating geometric patterns that grow in regular ways		3:4-7	3:4	3:4-7	3:4-7			3:4	3:4	
Exploring connections between geometric and numerical patterns	11, 76				3:1-7			3:1-7		
Exploring relationships among angles, line lengths, and areas of similar polygons		3:4-7	3:4	3:4-7	3:4-7			3:4-7	3:4-7	
TMM - Relating factors to their multiples and developing number sense about multiplication and division relationships		1:2 2:4-5 TMM	1:2 2:4-5 TMM	1:2 2:4-5 TMM						

**Name That Portion
(Fractions, Percents, and Decimals)**

Students use grids, arrays, number lines, clocks, and gender-participation surveys to make fraction, decimal, and percent comparisons and to solve computation problems. Through games and other activities, they develop familiarity with common fraction relationships.

	Problem Solving Experiences corresponding problem #	Content Strands								
		Number and Number Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement
Mathematical Emphases										
Interpreting everyday situations that involve fractions, decimals, and percents	26, 28, 40, 54, 88	1:1,2,7 2:9 3:1,7 4:1-4	1:1,2,7 2:9 3:1,7 4:1-4	1:1,2,7 2:9 3:1,7 4:1-4			3:1,7			
Using fractions and percents to name portions of groups	45, 145	1:1-4,7 2:9 3:7 4:1-2, 5-7	1:1-4,7 2:9 3:7 4:1-2, 5-7	1:1-4,7 2:9 3:7 4:1-2, 5-7						
Breaking fractions, decimals, and percents into familiar parts		1:1-4,7 2:4-9 3:5-8	1:1-4,7 2:4-9 3:5-8	2:4-8						
Approximating data as familiar fractions and percents, and in circle graphs		1:1,2 4:1-7	1:1,2 4:1-7	1:1,2 4:1-7			4:3-7			
Identifying and using equivalent fractions, percents, and decimals	70, 85, 95	1:1-7 2:1-9 3:1,3-8 4:1-7	1:1-7 2:1-9 3:1,3-8 4:1-7	1:2-7 2:1-9 3:1,3-8 4:1-7						
Representing, comparing, and ordering fractions (common; mixed number; with numerators larger than 1; with different denominators), decimals, and percents using landmark numbers and visual models	65, 120, 148	1:2-7 2:1-9 3:1-8 4:1-7	1:2-7 2:1-9 3:1-8 4:1-7	1:2-7 2:1-9 3:1-8 4:1-7						
Choosing models and notations to compute with fractions, percents, and decimals	41, 77, 130, 133, 143	1:7 2:1-9 3:1-8 4:1-7	1:7 2:1-9 3:1-8 4:1-7	1:7 2:1-9 3:1-8 4:1-7						
Identifying and labeling fractions between 0 and 1 on a number line to make an array of fractions		2:4-5	2:4-5	2:4-5						
Finding patterns in an array of fraction number lines and in a decimal table		2:4-5 3:5-6			2:4-5 3:5-6					
Solving word problems and expressing answers to fit the context	43, 69, 74, 79, 116, 138	1:1,7 2:9 3:7	1:1,7 2:9 3:7	1:1,7 2:9 3:7						
Finding decimals that are smaller than, larger than, or in between other decimals		3:3-6	3:3-6	3:3-6						
Planning and conducting surveys, and compiling, organizing, and communicating the results							4:1-7			
TMM--Finding ways to describe number relationships, including fraction notation, factor pairs, and equations		1:3-4 2:3,6 TMM	1:3-4 2:3,6 TMM			1:3-4 2:3,6 TMM				
TMM--Interpreting, posing questions about, and using fractions to describe data		3:2,5-6 TMM	3:2,5-6 TMM	3:2,5-6 TMM			3:2,5-6 TMM			

**Between Never and Always
(Probability)**

Students develop their probabilistic intuition by conducting experiments, analyzing the fairness of games, and comparing expectations to what actually happens.

	Problem Solving Experiences corresponding problem #	Content Strands								
		Number and Number Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement
Mathematical Emphases										
Distinguishing certain events from those that are not, and distinguishing events with different probabilities								1:1-2		
Learning to associate the word probability with how likely something is to occur	55, 75							1:1-2		
Matching verbal and numeric descriptions of probability		1:1-2	1:1-2					1:1-2		
Linking equivalent fractions, decimals, and percents		1:1-2	1:1-2					1:1-2		
Interpreting a probability as a measure or quantity	100	1:1-2	1:1-2, 3-4,5					1:1-2, 3-4,5		
Understanding that repeating a probability experiment can produce a variety of results							1:3-4	1:3-4,5 2:1-2		
Using probability to predict how often an event will happen and to select events most likely to occur			1:3-4, 5,7	1:5				1:3-4,5 2:1-2		
Plotting results of probability experiments on line plots and interpreting the data represented							1:3-4, 5,6	1:3-4, 5,6		
Comparing expected outcomes with actual outcomes							1:3-4, 5,6	1:3-4, 5,6		
Estimating probabilities from results of actual trials							1:6	1:6		
Inferring theoretical probabilities (e.g. 1/4) from looking at spinners divided into sectors							1:3-4	1:3-4,5		
Predicting and analyzing features of distributions, including center and variability							1:3-4, 5,6	1:3-4, 5,6		
Identifying numbers in terms of multiples/ factors, odds/evens, primes			1:7							
Adding probabilities of simple events (e.g. of rolling a die and getting 2) to obtain probabilities of types of events (rolling a die and getting an even number)			1:7	1:7				1:7		
Interpreting the fairness of a game as equal probability to win							2:1-2, 3,4-5	2:1-2, 3,4-5		
Breaking composite events into elementary events								1:7		
Developing systematic ways to generate a list of all possibilities	36, 66, 71, 106, 136							1:7 2:1-2		
Applying knowledge of probability to design a fair game, and writing directions others can follow								1:7 2:1-2, 4-5		
Distinguishing games of chance from games of skill								2:1-2, 3		

TMM = Ten Minute Math

**Between Never and Always
(Probability)**
CONTINUED

	Problem Solving Experiences corresponding problem #	Content Strands								
		Number and Num- ber Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement
Analyzing group data in term of general features (e.g. center, spread)							2:3	2:3		
Appreciating that, even in fair games, variability in results can make a game appear unfair							2:3	2:1-2,3		
TMM--Approximating numbers, calculating mentally, and comparing numbers to find the closest answer	57, 82	1:3-4 2:1-2 TMM		1:3-4 2:1-2 TMM						

**Building on Numbers You Know
(Computation and Estimation Strategies)**

Students invent and explain strategies for adding, subtracting, multiplying, and dividing that are based on their understanding of the numbers in the problems.

	Problem Solving Experiences corresponding problem #	Content Strands								
		Number and Number Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement
Mathematical Emphases										
Skip counting by 2-, 3-, and 4-digit numbers (including landmark numbers)	87	1:1-5 4:1-2 5:4-6	1:1-5 4:1-2 5:4-6	1:1-5 4:1-2 5:4-6						
Relating skip counting to multiplication and division			1:1-5 4:1-2 5:4-6							
Finding and using patterns in sequences of multiples	30	1:1-5	1:1-5	1:1-5						
Reading, writing, and ordering large numbers, and approximating them to the nearest multiple of 100 or 1000		1:2,5-8 4:1-2 5:1-2, 4-6	1:2,5-8 4:1-2 5:1-2, 4-6							
Developing strategies for determining and comparing distances between numbers	17, 38, 78	1:2,6-8 5:1-2		1:2,6-8 5:1-2						
Using random digits to approximate 4- or 5-digit numbers	92, 137	1:6-8	1:6-8							
Developing, recording, explaining, and comparing strategies for estimating and solving subtraction, multiplication, and division problems in more than one way	2, 24, 27, 32, 34, 44, 52, 63, 89, 97, 104, 109	1:2-8 2:1-7 3:1-10 4:1-2 5:1-8	1:2-5 2:1-7 3:1-10 4:1-2 5:1-8	1:2-8 2:1-7 3:1-10 4:1-2 5:1-8						
Making sense of remainders in a variety of contexts	93	2:1-7 3:4-10 5:1-8	2:1-7 3:4-10 5:1-8	2:1-7 3:4-10 5:1-8						
Interpreting, recording, and using division and multiplication notation in a variety of situations	13, 16, 23, 33, 53, 68, 73, 86, 94, 98, 116, 118, 119, 122, 128			2:1-7 3:4-10 5:1-8		2:1-7 3:4-10 5:1-8				
Understanding and explaining the relationships among the four basic operations, and using those relationships to solve problems and model situations	9, 20, 48, 49, 59, 99, 124, 134, 139, 147	1:1-8 2:1-3, 5-6 3:4-10 4:1-2 5:1-8	1:1-5, 6-8 2:1-3, 5-6 3:4-10 4:1-2 5:1-8	1:1-8 2:1-3, 5-6 3:4-10 4:1-2 5:1-8		1:1-8 2:1-3, 5-6 3:4-10 4:1-2 5:1-8				
Developing real-life meaning for quantities in the thousands, ten thousands, and hundred thousands, and beginning to acquire a sense of the size of 1,000,000	112, 142	2:7 4:1-2 5:4-6								2:7

**Building on Numbers You Know
(Computation and Estimation Strategies)**
CONTINUED

	Content Strands									
	Problem Solving Experiences corresponding problem #	Number and Number Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement
Breaking difficult computation problems into manageable parts	41, 46, 56, 102, 113, 126	3:1-10 5:1-8	3:1-10 5:1-8	3:1-10 5:1-8						
Using a rectangular array model to represent factor pairs of numbers 10,000 and larger		4:1-2 5:4-6	4:1-2 5:4-6	4:1-2 5:4-6						
TMM--Visualizing ratios, making predictions, and exploring the relationship of a sample to its group		1:5 2:1-2					1:5 2:1-2	1:5 2:1-2		
TMM--Developing concepts and language to communicate about shapes, patterns, and visual images	5, 76								3:1-3 5:1-2	

**Measurement Benchmarks
(Estimating and Measuring)**

Students estimate, take, and compare measurements using tools such as meter sticks, balance scales, liter measures, and timers. They compare metric and U.S. standard units of measure qualitatively, without arithmetic conversion.

	Problem Solving Experiences corresponding problem #	Content Strands									
		Number and Number Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement	
Mathematical Emphasis											
Using tools for measuring length, weight, volume and time	25										1:1,3,4, 5-6,7 2:3,4 3:1
Recognizing metric and U.S. standard measurement											1:1 2:1-2,4
Recognizing uses of benchmarks in estimation	82			2:3							1:2,3
Deciding when precise measurement is required and when estimates are sufficient	17, 27, 37, 62, 107, 117, 123			1:7-8			1:7-8				1:2-3, 7-8
Recognizing and explaining possible sources of measurement error				1:7-8			1:7-8				1:4,7-8
Comparing lengths expressed in different ways (e.g. meters and centimeters, meters and decimal fractions of a meter, meters and fractions of a meter)											1:4,5-6
Keeping track of and calculating total measurements	108, 149			1:5-6, 7-8							1:3,4, 5-6,7-8
Developing benchmarks for and measuring distances of 100 meters				1:5-6							1:5-6
Comparing distances expressed in hundreds or thousands of miles or kilometers				1:7-8			1:7-8				1:7-8
Calculating approximate distances on maps				1:5-6, 7-8			1:7-8				1:5-6, 7-8
Exploring conversion relationships between metric and U.S. standard measures of weight and liquid							2:1-2				2:1-8
Ordering items by measures of weight and of liquid amount	110			2:1-2							2:1-2, 7-8
Gaining a sense of metric and U.S. standard measures of weight and capacity, and developing benchmarks for these measures											2:1,2,3, 4
Measuring with a liter measure marked in milliliters											2:4
Developing a sense of volume as the space something occupies or the capacity of a container											2:2,4,5
Reasoning about factors that influence capacity (e.g. features of a container's shape, such as height and width)											2:4
Beginning to develop the concept of density											2:5

**Measurement Benchmarks
(Estimating and Measuring)**
CONTINUED

	Problem Solving Experiences corresponding problem #	Content Strands								Measurement
		Number and Num- ber Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	
Distinguishing between quantity and weight										2:5
Writing about weight, liquid capacity, and density										2:3,4,5
Using graphs to organize data and to determine typical data	31, 131	2:7-8	2:7-8				2:7-8			2:7-8
Developing benchmarks for large numbers of pounds				2:7-8						2:7-8
Determining relative quantities: how many times as heavy or how many times as long as another object an object is				2:7-8						2:7-8
Developing vocabulary for units of time										3:1
Developing benchmarks for minutes and years										3:1,3
Timing in minutes and seconds										3:1
Collecting and analyzing data		3:1,2					3:1,2			3:1
Keeping track of computation in a multistep problem	14, 19, 64, 114, 129			3:2,3			3:2			3:2,3
TMM--Looking as the problem as a whole, looking at the largest part of each number first, and reordering or combining numbers to simplify it		1:2 1:5-6 TMM	1:2 1:5-6 TMM	1:2 1:5-6 TMM						
TMM--Using evidence and formulating questions to logically and systematically order, sort, and eliminate measurement units as possible solutions										2:4 3:1 TMM

**Patterns and Change
(Tables and Graphs)**

Students use number patterns, graphs, and other visual representations to analyze movement, races, and the growth of geometrical patterns of their own design. They relate these representations to each other and to changing action that they describe.

	Content Strands									
	Problem Solving Experiences corresponding problem #	Number and Number Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement
Mathematical Emphases										
Building tile designs to grow according to regular number patterns, continuing them, and predicting later steps of number patterns, tiles designs, and graphs	96	1:1-4	1:1-4	1:1-4	1:1-4	1:1-4			1:1-4	1:1-4
Comparing sequences of numbers and shapes of graphs	61	1:1-4	1:1-4	1:1-4	1:1-4	1:1-4	1:1-4			1:1-4
Comparing graph shapes to describe rates of growth	39, 146				1:1-4 2:1-5 3:1-7	1:1-4 2:1-5 3:1-7				1:1-4 2:1-5 3:1-7
Exploring, reflecting on, and representing relationships among distance, time, and speed		2:2-5 3:1-6		2:2-5 3:1-6	2:1-5 3:1-7	2:1-5 3:1-7	2:1-5 3:1-7			2:1-5 3:1-7
Making, interpreting, and comparing tables, graphs, and stories that show accumulated distance and speed	6	2:2-5 3:2-6		2:2-5 3:2-6	2:1-5 3:2-6	2:2-5 3:2-6	2:2-5 3:2-6			2:2-5 3:2-6
Collecting and recording data in regular time intervals to analyze patterns of change	127						2:2			2:2
Exploring relationships between discrete and continuous descriptions of motion					2:2 3:2	2:2 3:2				
Comparing relative motion					3:1-6	3:1-6				
Relating number patterns to graphical shapes					1:1-4 2:1-5 3:1-7	1:1-4 2:1-5 3:1-7				
Illustrating relative change or motion in an animation					3:7					
TMM--Approximating numbers, calculating mentally, and comparing numbers to find the closest answer	12, 22, 47	1:2-4 2:1 TMM		1:2-4 2:1 TMM						
TMM--Attending to important features of a graph (e.g. relative height, slope) to imagine the stories behind graphs of changes over time and to draw graphs to fit particular stories	81, 91, 121, 131				3:1 TMM	3:1 TMM	3:1 TMM		3:1 TMM	

**Containers and Cubes
(3-D Geometry: Volume)**

Students explore the concept of volume. They develop strategies for finding the volumes of boxes, and they investigate volume relationships between pyramids and prisms and cylinders and cones.

	Problem Solving Experiences corresponding problem #	Content Strands								
		Number and Number Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement
Mathematical Emphases										
Seeing 3-D rectangular arrays of cubes in terms of congruent layers	1								1:1-2	1:1-2
Determining how many cubes fit in a rectangular box		1:1-4		1:1-4					1:1-4	1:1-4
Applying multiplication to find the number of cubes in a box		1:1-4		1:1-4					1:1-4	1:1-4
Determining the relationship between the number of cubes that fill a rectangular box and its dimensions		1:1-4		1:1-4					1:1-4	1:1-4
Organizing packages to fit rectangular boxes	111	2:1-5		2:1-5					2:1-5	2:1-5
Developing strategies for enumerating rectangular packages that fill boxes		2:1-5		2:1-5					2:1-5	2:1-5
Designing boxes to hold packages of different sizes	150	2:3-4		2:3-4					2:3-4	2:3-4
Understanding the relationship between the dimensions of a box and how many packages fill it		2:1-5		2:1-5					2:1-5	2:1-5
Understanding the concept of volume and units of volume									1:1-4 2:1-5 3:1-3 4:1-9	1:1-4 2:1-5 3:1-3 4:1-9
Seeing and using cubic centimeters as a unit for measuring volume (including nonrectangular solids)		3:1 4:4-9		3:1 4:4-9					3:1 4:4-9	3:1 4:4-9
Deciding on, construction, and visualizing appropriate units of volume for measuring large-scale spaces									3:2-3	3:2-3
Understanding characteristics of units of volume, such as shape and size									3:1-3 4:1-9	3:1-3 4:1-9
Developing, using, describing, and justifying methods of determining volume		1:1-4 2:1-5 3:1-3 4:1-9		1:1-4 2:1-5 3:1-3 4:1-9					1:1-4 2:1-5 3:1-3 4:1-9	1:1-4 2:1-5 3:1-3 4:1-9
Comparing the volume of one room to another		3:3		3:3					3:3	3:3
Exploring volume relationships among different containers and among solids, particularly those with the same base and height		4:2-9		4:2-9					4:1-9	4:1-9
Using geometric solids to design models and to determine their volume		4:7-9		4:7-9					4:7-9	4:7-9
TMM--Becoming familiar with multiplication patterns, relationships between factors and their multiples, and relationships between multiplication and division		1:1-2 2:3-4 TMM	1:1-2 2:3-4 TMM							
TMM--Using evidence and formulating questions to logically and systematically order, sort, and eliminate measurement units as possible solutions									TMM = Ten Minute Math 1:2-3 = Investigation 1, Sessions 2-3	4:1 TMM

**Data: Kids, Cats and Ads
(Statistics)**

Students examine and compare data sets, including data sets with several variables. They learn about selecting a reasonable and fair sample. They use fractions between 0 and 1 to describe probabilities.

	Problem Solving Experiences corresponding problem #	Content Strands								
		Number and Number Relationships	Number Sense and Number Theory	Computation and Estimation	Patterns, Relations and Functions	Algebra	Statistics	Probability	Geometry	Measurement
Mathematical Emphases										
Finding medians and other fractional parts of data sets		1:1-4 2:1-3 3:1-4 5:3-5		1:1-4 2:1-3 3:1-4 5:3-5			1:1-4 2:1-3 3:1-4 5:3-5			
Making theories, statements, conclusions, and recommendations based on organized data	58	1:2-4 3:2-3 4:3		1:2-4 3:2-3 4:3			1:1-4 2:1-2 3:2-4 4:3 5:1,3-5			
Using data characteristics to identify data sets, to describe numerical and categorical variables, and to compare a sample to a larger population						1:4 2:1-3 3:2-4 4:3 5:1,3-5				
Collecting, organizing, and collating data, and making line plots and tables to examine and compare data sets						1:4 2:1-3 3:1-4 4:2-3 5:2-5			1:1 2:1	
Framing questions about variables in a data set, and using representations and descriptions to answer them						2:2-3 5:1-5				
Using a computer and database tool to enter, analyze, and examine data in a computer database						2:3 5:3-5				
Comparing and adding fractions using numerical reasoning and visual representations and by converting unfamiliar fractions to more familiar fractions	143	1:1-4 2:1-3 3:1-4 4:1-3 5:3-5	3:1-4	1:1-4 2:1-3 3:1-4 4:1-3 5:3-5					4:1-3 4:1-3	
Finding equivalents among fractions, decimals, and percents, and using them to compare data from a sample with a target fraction	40	3:1-4 4:3 5:3-5		3:1-4 4:3 5:3-5			3:2-4 4:3 5:3-5		4:3	
Learning what a sample is, learning what some of the factors (including size) that make a sample reasonable are, and discovering why a large sample tends to reflect a population better than a small sample						2:1 3:1-4 4:1-3 5:2				
Developing strategies to find representative samples	26, 91					3:2-4 4:2-3 5:2				
Formulating, testing, defining, and refining survey questions, and designing a survey						5:1-2				
TMM--Reasoning about place value, and developing strategies for comparing number and the distance between numbers		1:2-3 2:2 TMM	1:2-3 2:2 TMM	1:2-3 2:2 TMM						
TMM--Organizing and finding the number of cubes that fill (and squares that cover) simple 3-D solids				3:2-3 4:2 TMM			TMM = Ten Minute Math 1:2-3 = Investigation 1, Sessions 2, 3		3:2-3 4:2 TMM TMM	