

Unit 1: Naming and Constructing Geometric Figures							
<b>Overview:</b> To introduce students to the Student Reference Book; to practice using geometry tools; to classify quadrangles; to explore and identify polygons; and to review and practice addition and subtraction facts.							
<b>Big Ideas</b>	<b>Measurement &amp; Geometry:</b> Objects and two-dimensional shapes can be quantified, classified, described and analyzed by their attributes and by using unit amounts.						
Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
1♦1 1.2.D Demonstrate the inverse relationship between addition and subtraction by undoing an addition problem with subtraction and vice versa. 2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20. 4.2.B Read, write, compare, and order decimals through hundredths.	Use fact triangles to note the inverse relationship between addition and subtraction (Part 2). PE 1.2.D			P3R <i>Relation Symbol Top-It</i> . MM p6 PE 4.2.B	For Part 2, copy fact triangles, MM p384-387 onto cardstock. Have plastic bags or envelopes available for storage.	Demonstrate automaticity with addition facts. PE 2.2.A	
1♦2 3.1.D Estimate sums and differences to approximate solutions to problems and determine reasonableness of answers. 3.4.A Identify and sketch parallel, intersecting, and perpendicular lines and line segments. 4.1.E Compare the values represented by digits in whole numbers using place value.	Identify and draw line segments, lines and rays. PE 3.4.A	<b>Exit Slip:</b> This is the first opportunity for students to communicate their thinking. Make sure to model specifically how to use their math log/notebook/exit ticket to establish a routine (TLG p27). Start your word wall or anchor charts with examples to keep track of vocabulary as it is introduced.	point, line segment, endpoint, line, ray	P2 <i>Addition Top-It</i> . SRB p263, MM p506 PE 3.1.D, 4.1.E P3E <i>Sprouts</i> . SRB p313 PE 3.4.A	For Part 1, assign an ID number to each student. Label students' math tools with these ID numbers. Have extra socks for slate erasers.	Describe a line segment and a line. PE 3.4.A	
1♦3 3.4.C Identify and describe special types of quadrilaterals.	Identify and describe properties of quadrangles. PE 3.4.C		angle, vertex, right angle, triangle, quadrangle, quadrilateral, square, rhombus, rectangle, parallelogram, trapezoid, kite, perpendicular		For Part 1, each student will need 4 of each size straw and 4 twist-ties. Place full-length, half-length and 3/4 – length straws in separate boxes.	Compare and contrast plane figures. PE 3.4.C	TLG p33, "Describe how you might solve No. 5b."
1♦4 2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20. 3.4.A Identify and sketch parallel, intersecting, and perpendicular lines and line segments. 3.4.C Identify and describe special types of quadrilaterals. 4.5.E Select and use one or more appropriate strategies to solve a problem and explain why that strategy was chosen.	Develop definitions for parallel and intersecting line segments, lines, and rays. PE 3.4.A	Reinforce vocabulary words "attributes" and "parallel" with parallelograms.	parallel lines, intersect, parallel line segments, parallel rays, perpendicular line segments, attribute	P2 <i>Subtraction Top-It</i> . SRB p263, MM p506; PE 2.2.A P3E <i>Sz'kwa</i> . SRB p310, MM p505 PE 4.5.E	Copy MM p14 for Math Message.	Understand parallel line segments. PE 3.4.A	TLG p39, "For No. 3, some students wrote that Mya sold 4 ½ boxes of cookies. Explain the mistake they might have made when reading the graph."
1♦5 2.4.A Solve problems involving properties of two- and three-dimensional figures.	Define properties of polygons. PE 2.4.A▲		side, angle, pentagon, polygon, vertex (vertices), convex, non-convex or concave, hexagon, heptagon, octagon, nonagon, <i>n</i> -gon, interior, regular polygon, equilateral triangle		For Part 1, each student will need 8 twist-ties and 3 of each size straw from Lesson 1♦3 above. Readiness activity uses the book, <i>The Greedy Triangle</i> .	Explain the properties of polygons. PE 2.4.A▲	
1♦A 4.3.A Determine congruence of two-dimensional figures.	Recognize congruent figures using transformations (slides, turns & flips). PE 4.3.A	<b>Supplemental Lesson</b> to support Congruence <b>Gr4 Texas Project #10: Congruence</b> Do all activities in Part 1 except for the last activity on Texas 6 flags. Skip all of Part 2.	congruent, isometric transformation, translation, reflection, rotation, (slide, flip, turn)		Make cardstock copies for each pair of students of MM p381B		

1♦6 & 1♦7	<p><b>2.4.A</b> Solve problems involving properties of two- and three-dimensional figures.</p> <p><b>3.4.B</b> Identify and sketch right angles.</p> <p><b>3.4.C</b> Identify and describe special types of quadrilaterals.</p> <p><b>4.3.A</b> Determine congruence of two-dimensional figures.</p>	<p>Identify and describe properties of polygons (Polygon Pair-Up). <b>PE 2.4.A▲</b></p>	<p><b>Combine</b> these two lessons into a <b>one day</b> lesson. Focus on exposure (20 minutes) of the compass as a tool, which will be needed in grade 5. The goal is to get students comfortable enough to be able to use their compasses for the next lesson. In addition to just drawing circles have them copy their partners circle (congruence <b>PE 4.3.A</b>). SMJ p18 is also good. Complete all activities in Part 2.</p>	<p>compass, circle, center (of a circle), inscribed square</p>	<p><i>P2 Polygon Pair Up</i>: SRB p258, MM p496-7 <b>PE 2.4.A, 3.4.C</b></p>	<p>For Part 2, copy MM p496-497 onto cardstock, minimum of 1 set per 2 students plus one Teacher set. Extra Practice activity uses the book, <i>Ed Emberley's Picture Pie</i>.</p>	<p>Understand right angles. <b>PE 3.4.B</b></p>	<p>TLG p50, "Explain why the shapes you chose in No. 2 are not polygons."</p>
	<p>circle, radius, congruent, concentric circles, intersect</p>	<p><i>P2 Polygon Pair Up</i>: SRB p258, MM p496-7 <b>PE 2.4.A, 3.4.C</b></p>	<p>For Part 1, paper for circle construction practice. MM p25, 1 per 2 students, cut apart.</p>	<p>Construct circles with a compass. <b>PE 2.4.A▲</b></p>	<p>TLG p55, "How can you use a basic subtraction fact like <math>9 - 7</math> in No. 1 to solve an extended subtraction fact like <math>900 - 700</math>?"</p>			
1♦8	<p><b>2.2.A</b> Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p><b>4.3.A</b> Determine congruence of two-dimensional figures.</p>	<p>Use a compass to copy a line segment. <b>PE 4.3.A</b></p>	<p><b>Modification:</b> Do first activity "Copying a Line segment". Use <b>Supplement 1♦8: Copying a Triangle</b> to extend this activity to have students copy a triangle using a compass. Model the steps first and then have them do one on their own. They can also copy the same triangle as a reflected (flipped) congruent shape. Skip next activities "Constructing an Inscribed Regular Hexagon" and "Dividing a Regular Hexagon" in Part 1. Complete all activities in Part 2.</p>	<p>Congruent, two-dimensional shape, attribute</p>		<p>For Parts 1 &amp; 3, paper for circle constructions practice.</p>	<p>Demonstrate automaticity with subtraction facts. <b>PE 2.2.A</b></p>	

Unit 2: Using Numbers and Organizing Data								
<b>Overview:</b> To examine different uses and equivalent names of numbers and review the base-ten place-value system; to review procedures for addition and subtraction of multidigit whole numbers; and to reintroduce and extend ideas about data collection, organization, display, and analysis.								
<b>Big Ideas</b>		<b>Equivalence 2:</b> Numbers represent set values that can be composed (put together) and decomposed (taken apart). <b>Estimation:</b> Numerical calculations can be approximated by replacing numbers with other numbers that are close and easy to compute. <b>Data:</b> Data can be collected, classified, analyzed & displayed using tables, charts & graphs.						
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
2♦1	<p><b>2.2.F</b> Create and state a rule for patterns that can be generated by addition and extend the pattern.</p> <p><b>2.4.A</b> Solve problems involving properties of two- and three-dimensional figures.</p> <p><b>3.4.C</b> Identify and describe special types of quadrilaterals.</p> <p><b>4.5.H</b> Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.</p>	Determine if estimate or exact count is needed (World Tour Project). <b>PE 4.5.H</b>	<b>Optional:</b> World Tour: Do Part 2.		<i>P2 Polygon Pair Up.</i> SRB p258, MM p496-7 <b>PE 2.4.A &amp; 3.4.C</b>	MM p 38, 1 copy per 2 students, cut apart. Read about the World Tour Project in SRB p266.	Compute extended addition facts. <b>PE 2.2.F</b>	
2♦2	<p><b>3.5.A</b> Determine whether two expressions are equal and use “=” to denote equality.</p> <p><b>4.4.A</b> Represent an unknown quantity in simple expressions, equations, and inequalities using letters, boxes, and other symbols.</p> <p><b>5.5.C</b> Construct and interpret line graphs.</p>	Use numerical expressions (number models) to give equivalent values for whole numbers (name-collection box). <b>PE 3.5.A</b>	In 3 <sup>rd</sup> grade, students were encouraged to include at least one example using base-ten blocks, and one example of expanded form when completing Name-Collection Boxes.	equivalent, name-collection box, <b>expression</b>	<i>P2 Name That Number.</i> SRB p254, MM p489 <b>PE 4.4.A, 5.5.C</b>	Set aside space for “Numbers and their Uses Museum”.	Give equivalent names for whole numbers. <b>PE 3.5.A</b>	TLG p92, “Explain how you know that the polygon you drew in No. 3 is convex and not concave.”
2♦3	<p><b>2.1.D</b> Write 3-digit numbers in expanded form.</p> <p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p>	Identify values for digit in very large numbers. <b>PE 4.1.E▼ &amp; 2.1.D▲</b>	To better address <b>PE 4.1.E</b> comparing the values of the digits, ask comparative questions after students complete SMJ p33. For example “How much bigger is the 4 in problem #6 than the four in problem #3?” From now on, whenever students are comparing large numbers, make sure you ask some comparative questions about the digits too.	counting number, whole number, digit place		MM p398; make one copy OR make a place value chart.	Identify the values of digits in whole numbers. <b>PE 4.1.E▼</b>	TLG p98, “Explain how you know that the circles you drew for No. 3 are concentric.”
2♦4	<p><b>2.1.D</b> Write 3-digit numbers in expanded form.</p> <p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p>	Manipulate values for digits in very large numbers. <b>PE 4.1.E▼</b>	For “Practicing Place Value Skills” ask student to compare the value of the “9” in “e.” and “c.” to support <b>PE 4.1.E</b> . If your students need additional place value support, do the Readiness Activity “Using a Place-Value Tool”.		<i>P2 Fishing For Digits.</i> SRB p242, MM p472 <b>PE 4.1.E</b>	For Readiness Activity, prepare compact place-value flipbooks. MM p399-402.	Identify places in whole numbers and the values of the digits in those places. <b>PE 4.1.E▼ &amp; 2.1.D▲</b>	
2♦5	<p><b>2.2.A</b> Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p><b>3.1.D</b> Estimate sums and differences to approximate solutions to problems and determine reasonableness of answers.</p> <p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p> <p><b>4.4.E</b> Determine the median, mode, and range of a set of data and describe what each measure indicates about the data.</p>	Find the maximum, minimum, range and mode for data set. <b>PE 4.4.E</b>	Start with Readiness Activity MM52 “Recording Data With Tally Marks”. <b>NOTE:</b> save the Raisin Data to use in 2♦6.	guess, estimate, tally chart, landmark, maximum, minimum, range, mode	<i>P2 Addition Top-It.</i> SRB p263, MM p506 <b>PE 3.1.D, 4.1.E</b>	Get ½ oz boxes of raisins, 1 per student. See TLG p106.	Compute basic addition facts. <b>PE 2.2.A</b>	TLG p110, “Explain how you know that the pairs of sides you chose in No. 4 are parallel.”

2♦6	<p><b>2.2.A</b> Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p><b>4.4.E</b> Determine the median, mode, and range of a set of data and describe what each measure indicates about the data.</p>	Find the median for a data set. <b>PE 4.4.E</b>	Start with Readiness Activity MM55 "Finding the Middle Value". After completing Part 1, go back to your Raisin Data from 2♦5 to determine the median.	line plot, median	<i>P2 Subtraction Top-It</i> : SRB p263, MM p506 <b>PE 2.2.A</b>		Identify the maximum, minimum, range, and mode of a data set. <b>PE 4.4.E</b>	
2♦7	<p><b>3.1.C</b> Fluently and accurately add and subtract whole numbers using the standard regrouping algorithms.</p> <p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p> <p><b>8.4.C</b> Evaluate numerical expressions involving non-negative integer exponents using the laws of exponents and the order of operations.</p>	Use the partial-sums algorithm to solve multi-digit addition problems. <b>PE 3.1.C</b>	When working with Algorithms, students should have at least two strategies mastered to support flexibility when solving problems (i.e. when solving 310+49 it is more efficient to use mental math or counting up rather than other strategies). Several different models are presented in the lesson. Focus on the connection between place value and any strategies students use. <b>Modification:</b> Rather than playing <i>High Number Toss</i> , play <i>Fishing for Digits</i> from lesson 2♦4.	partial-sums method, column-addition method, ballpark estimate	<i>P2 High Number Toss</i> : SRB p252, MM p487 <b>PE 8.4.C</b> <i>P2 Fishing For Digits</i> : SRB p242, MM p472 <b>PE 4.1.E</b>	<b>2-day lesson.</b> Computation Grids MM p403 or p404 (if needed). See TLG p119	Solve multi-digit addition problems. <b>PE 3.1.C▲</b>	TLG p123, "Shannel said, "I can draw a rhombus, rectangle, square, or kite for No.4." Do you agree or disagree? Explain your answer."
2♦8	<b>4.4.E</b> Determine the median, mode, and range of a set of data and describe what each measure indicates about the data.	Draw conclusions based on data landmarks from a bar graph. <b>PE 4.4.E</b>		bar graph		For Readiness activity: Cut apart and tape 4 copies of MM p406 per pair of students.	Use data landmarks and bar graphs to draw conclusions about a data set. <b>PE 4.4.E</b>	TLG p130, "Describe the patterns in the number sentences in No. 1."
2♦9	<b>3.1.C</b> Fluently and accurately adds and subtracts whole numbers using the standard regrouping algorithms.	Use an algorithm to solve multi-digit subtraction problems. <b>PE 3.1.C</b>	Plan to spend two days on this lesson. When working with Algorithms, students should have at least two strategies mastered to support flexibility when solving problems (i.e. when solving 300-99 it is more efficient to use mental math or counting up rather than other strategies). Several different models are presented in the lesson. Focus on the connection between place value and any strategies students use.	trade-first method, partial-differences method	<i>P2 Subtraction Target Practice</i> : SRB p262, MM p504 <b>PE 3.1.C</b>	<b>2-day lesson.</b> Computation Grids MM p403 or p404 (if needed). See TLG p132	Solve multi-digit subtraction problems. <b>PE 3.1.C</b>	

Unit 3: Multiplication and Division; Number Sentences and Algebra								
<b>Overview:</b> To review strategies for solving multiplication facts; and to help students work toward instant recall of the multiplication facts; to provide practice interpreting data, measuring length, and using a map scale through the World Tour Project, to introduce a simplified approach to solving number stories; and to provide practice solving number stories, and to provide practice with number sentences and open sentences.								
<b>Big Ideas</b>	<b>Equivalence 1:</b> Any number, numerical expression or equation can be represented in multiple ways. <b>Number Relationships:</b> There is an inverse relationship between addition and subtraction operations and between multiplication and division operations when using rational numbers.							
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
3♦1	<p><b>2.2.G</b> Solve equations in which the unknown number appears in a variety of positions.</p> <p><b>5.4.A</b> Describe and create a rule for numerical and geometric patterns and extend the patterns.</p>	Use operation rules to complete function tables. <b>PE 5.4.A▼</b>		function machine, input, output, rule, "What's My Rule?"			Complete "What My Rule?" tables. <b>PE 2.2.G</b>	TLG p161, "Explain how you found the range of the data set in No. 2."
3♦2	<p><b>3.2.D</b> Apply and explain strategies to compute multiplication facts to 10 X 10 and the related division facts.</p> <p><b>3.4.A</b> Identify and sketch parallel, intersecting, and perpendicular lines and line segments.</p> <p><b>4.1.A</b> Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p><b>4.1.G</b> Mentally multiply two-digit numbers by numbers through 10 and by multiples of 10.</p> <p><b>4.4.A</b> Represent an unknown quantity in simple expressions, equations, and inequalities using letters, boxes, and other symbols.</p>	Share and justify strategies to quickly solve basic multiplication facts that have not yet been memorized. <b>PE 3.2.D</b>	This is an important lesson to support fact fluency ( <b>PE 4.1.A</b> ). Students focused on 1, 2, 5, and 10 facts in grade 3. Timed tests are not instruction, but rather an assessment of what facts students know. Include strategy instruction frequently throughout the year. Most students should master their facts by unit 5. Play multiplication games frequently to support fact fluency. Share and justify strategies are mentioned in several Learning Targets. At times, the TLG mentions sharing opportunities but there may not be a detailed description of a possible discussion. As part of High Leverage Moves, have more than one student not only share, but also to explain why or how they determined their responses.	multiplication facts, factors, products, factor pair, multiples, square numbers, turn-around facts	<i>P2 Name That Number:</i> SRB p254, MM p489; <b>PE 4.4.A, 5.5.C</b> <i>P3EP Buzz and Bizz-Buzz:</i> SRB p234 <b>PE 4.1.G</b>	Part 1, plan for storage of fact triangles – envelopes, plastic bags. Think about how to pair students – similar skill levels.	Use numerical expressions involving arithmetic operations to give equivalent names for whole numbers. <b>PE 3.4.A▲</b>	
3♦3	<p><b>3.1.D</b> Estimate sums and differences to approximate solutions to problems and determine reasonableness of answers.</p> <p><b>4.1.A</b> Quickly recall multiplication facts to 10x10.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p>	Use divisibility rule for 9s to develop automaticity with multiplication facts. <b>PE 4.1.A</b>	This would be a good opportunity to have student's set goals for which facts they should focus on first.	percent	<i>P2 Baseball Multiplication:</i> SRB p231, MM p460; <b>PE 4.1.F</b> <i>P3EP Multiplication Top-It:</i> SRB p264, <b>PE 4.1.F</b>	Read background information TLG p169 about the 5-facts test.	Estimate reasonable solutions for whole-number addition and subtraction problems. <b>PE 3.1.D</b>	
3♦4	<p><b>3.5.E</b> Construct and analyze pictographs, frequency tables, line plots, and bar graphs.</p> <p><b>4.1.A</b> Quickly recall multiplication facts to 10x10.</p> <p><b>5.5.C</b> Construct and interpret line graphs.</p>	Use 50-facts test data to create a line graph. <b>PE 4.1.A &amp; 5.5.C</b>	<b>Caution:</b> Prior to printing Math Message, replace mean with mode in question #2 (four times) and question 3 in Follow-Up. Mean is a fifth grade standard.			Caution: See Comments for Lesson 3♦4. Prepare classroom graph for 50-fact tests.	Demonstrate automaticity with the *0, *1, *2, *5 and *10 multiplication facts. <b>PE 3.2.E</b>	TLG p178, "Explain how you solved No. 3c."
3♦5	<p><b>3.2.C</b> Determine products, quotients, missing factors using the inverse relationship between multiplication and division.</p> <p><b>4.1.A</b> Quickly recall multiplication facts 10x10 and related division facts.</p> <p><b>4.1.G</b> Mentally multiply two-digit numbers by numbers through 10 and by multiples of 10.</p> <p><b>5.1.C</b> Fluently and accurately divide up to a four digit number by one- or two-digit divisors using the standard long-division algorithm.</p>	Use Fact Triangles to develop automaticity with multiplication/division facts. <b>PE 3.2.C &amp; 4.1.A</b>		dividend, divisor, quotient, remainder, fact family	<i>P2 Beat the Calculator:</i> SRB p233, MM p461; <b>PE 4.1.G</b> <i>P3R Division Arrays:</i> SRB p240, MM p470 <b>PE 5.1.C</b>	Before Part 1, collect reference materials. See TLG p186. Readiness activity uses the book, <i>Nine O'Clock Lullaby</i> .	Use conventional notation to write multiplication and division number sentences. <b>PE 3.2.C</b>	

3♦6	<p><b>3.1.C</b> Fluently and accurately add and subtract whole numbers using the standard regrouping algorithms.</p> <p><b>4.1.A</b> Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p> <p><b>4.5.A</b> Determine the question(s) to be answered given a problem situation.</p> <p><b>4.5.B</b> Identify information that is given in a problem and decide whether it is necessary or unnecessary to the solution of the problem.</p>	Use Fact Triangles to develop automaticity with multiplication/division facts. <b>PE 4.1.A</b>	<b>Combine</b> lessons 3♦6 and 3♦7 for a <b>one day</b> lesson. <b>Optional:</b> Part 1 World Tour Project. Play both games, do both math boxes, and Study Link 3♦6. If your students need additional practice measuring with a ruler, have them do the readiness activity "Measuring to the nearest half-inch" in lesson 3♦7.		P2 <i>Multiplication Top-It</i> : SRB p264, MM p506; <b>PE 4.1.F</b> P3E <i>Seega</i> : SRB p309, MM p503 <b>PE 4.5.A</b>	For Part 1, borrow globes. See TLG p192	Solve multi-digit addition and subtraction problems. <b>PE 3.1.C</b>	
3♦7	<p><b>2.3.C</b> Measure length to the nearest whole unit in both metric and U.S. customary units.</p> <p><b>2.4.A</b> Solve problems involving properties of two- and three-dimensional figures.</p> <p><b>3.4.C</b> Identify and describe special types of quadrilaterals.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p>				P2 <i>Polygon Pair Up</i> : SRB p258, MM p496-7 <b>PE 2.4.A, 3.4.C</b>	For Part 1, read SRB p175. You might want to make a class poster of MM p422, <i>A guide for Solving Number Stories</i> .	Use a map scale to estimate distances. <b>PE 2.3.C▲ &amp; 4.1.F</b>	TLG p196, "Is the polygon in No. 4 a regular polygon? Explain why or why not."
3♦8	<p><b>3.1.E</b> Solve single- and multi-step word problems involving addition and subtraction of whole numbers and verify the solutions.</p> <p><b>3.6.G</b> Explain why a specific problem-solving strategy or procedure was used to determine a solution.</p> <p><b>8.4.C</b> Evaluate numerical expressions involving non-negative integer exponents using the laws of exponents and the order of operations.</p>	Interpret word problems to write an equation (number model). <b>PE 3.1.E</b>		<b>equation</b>	P2 <i>High Number Toss</i> : SRB p252, MM p487 <b>PE 8.4.C</b>		Use and explain a strategy for solving an addition number story. <b>PE 3.6.G</b>	TLG p201, "Explain why you chose the measurement for No. 5."
3♦9	<p><b>3.1.A</b> Read, write, compare and order numbers to 10,000 using numbers, words and symbols.(less than, greater than)</p> <p><b>3.5.A</b> Determine whether 2 expressions are equal and use = to denote equality.</p>	Interpret and write correct and incorrect expressions. <b>PE 3.5.A</b>	Include an example like $3+5=8-2=6$ and ask the students if it is a true or false number sentence. This is called a "run-on equation". Teach students to use a semi-colon (i.e. $3+5=8$ ; $8-2=6$ ), or record equations on separate rows to avoid writing run-on equations (i.e. $3 + 5 = 8$ $8 - 2 = 6$ ).	number sentence, true number sentence, false number sentence, <b>equation</b>			Determine whether number sentences are true or false. <b>PE 3.5.A</b>	
3♦10	<p><b>4.1.A</b> Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p><b>4.4.A</b> Represent an unknown quantity in simple expressions, equations, and inequalities using letters, boxes, and other symbols.</p> <p><b>5.4.C</b> Write algebraic expressions that represent simple situations and evaluate the expressions, using substitution when variables are involved.</p> <p><b>5.5.C</b> Construct and interpret line graphs.</p>	Evaluate expressions using parentheses. <b>PE 5.4.C</b>	<b>Touch &amp; Go.</b> Although this lesson is not expected to develop mastery, it does provide a lot of computation practice. Do entire lesson whole group. Study link 3♦10 home should be done in class as part of the lesson.	parentheses	P2 <i>Name That Number</i> : SRB p254, MM p489 <b>PE 4.4.A, 5.5.C</b>		Demonstrate proficiency with basic division facts. <b>PE 4.1.A</b>	TLG p212, "Explain how you could use the bar graph in No. 3 to find the total number of books read by the students."
3♦11	<p><b>4.4.A</b> Represent an unknown quantity in simple expressions, equations, and inequalities using letters, boxes, and other symbols.</p> <p><b>4.5.E</b> Select and use one or more appropriate strategies to solve a problem and explain why the strategy was chosen.</p> <p><b>4.5.G</b> Explain why a specific problem-solving strategy or procedure was used to determine a solution.</p>	Share and justify solution strategies for open equations. <b>PE 4.4.A &amp; 4.5.E</b>	<b>Skip Part 2</b> "Using a Map Scale" and focus on Study Link MM p99 "Open Sentences".	variable, open sentence, solve solution, <b>expression</b>		Review background information on open sentences, TLG p214	Use and explain a strategy for solving open number sentences. <b>PE 4.5.G</b>	

Unit 4: Decimals and Their Uses								
<b>Overview:</b> To extend the base-ten place-value system to decimals; to review and extend basic concepts, notation and applications for decimals; to extend whole-number methods of addition and subtraction to decimals; and to review relationships among metric units of length, and guide students as they use them.								
<b>Big Ideas</b>	<b>Place Value:</b> The Base-Ten numeration system uses digits 0-9, which repeat in predictable ways and whose values are determined by their position. <b>Equivalence 1:</b> Any number, measure, numerical expression or equation can be represented in multiple ways.							
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
4♦1	<p><b>2.4.A</b> Solve problems involving properties of two- and three-dimensional figures.</p> <p><b>3.4.C</b> Identify and describe special types of quadrilaterals.</p> <p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p> <p><b>4.2.A</b> Represent decimals through hundreds with place value models, fraction equivalents, and the number line.</p>	Identify the values of digits in decimals. <b>PE 4.2.A</b>	Reinforce place value vocabulary. If you did not make place value books in lesson 2♦4, you may want to for the Extra Practice activity in Part 3.	Tenths, hundredths, thousandths	P2 <i>Polygon Pair Up</i> . SRB p258, MM p496-7 <b>PE 2.4.A &amp; 3.4.C</b>		Identify values of digits in whole numbers. <b>PE 4.1.E</b>	
4♦2	<p><b>3.1.A</b> Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p> <p><b>4.2.A</b> Represent decimals through hundreds with place value models, fraction equivalents, and the number line.</p> <p><b>4.2.B</b> Read, write, compare, and order decimals through hundredths.</p> <p><b>4.2.D</b> Convert a decimal to a fraction and vice versa, and visually.</p>	Relate fractions and decimals as part of one whole represented as a flat. <b>PE 4.2.A</b>	In Unit 4, students use base-10 blocks to explore decimals. The “ONE” changes and this concept should be made explicit to the students. Lesson 4♦2 uses the flat to model “ONE”. Later in 4♦7 it uses the BIG cube to model “ONE”. It is the most important concept for these lessons. Make sure students use manipulatives for this lesson.	ONE, whole, unit, tenth, hundredth	P2 <i>Baseball Multiplication</i> . SRB p231, MM p460; <b>PE 4.1.F</b> P3R <i>Base-10 Exchange</i> . SRB p456, MM p458-9 <b>PE 3.1.A</b>	Label one of each of the base-10 blocks: <i>flat, long</i> and <i>cube</i> .	Identify values of decimal digits. <b>PE 4.2.B</b>	TLG p248, “Explain the strategy you used in No. 4d to convert 10 quarters and 7 dimes into dollars and cents.?”
4♦3	<p><b>4.1.D</b> Determine reasonableness of answers.</p> <p><b>4.2.B</b> Read, write, compare, and order decimals through hundredths.</p>	Compare and order decimals through hundredths. <b>PE 4.2.B</b>		decimal	P2 <i>Product Pile-Up</i> . SRB p259; <b>PE 4.1.D</b> P3R <i>Coin Top-It</i> . MM p467&506 <b>PE 4.2.B</b>	Enrichment activity uses the books, <i>Everything Kids’ Joke Book...</i> , and <i>Kids’ Funniest Jokes</i> .	Compare decimals through hundredths. <b>PE 4.2.B</b>	TLG p252, “In No. 4, is the ray TC another name for the ray CT? Explain why or why not.”
4♦4	<p><b>3.1.D</b> Estimate sums and differences to approximate solutions to problems and determine reasonableness of answers.</p> <p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p> <p><b>4.2.H</b> Round fractions and decimals to the nearest whole number.</p>	Round decimal numbers for estimation. <b>PE 4.2.H</b>	Model Mental Math and complete as whole group. This is the first time students are asked to round decimals. Provide ample time for <i>Number Top-It With Decimals</i> .	trip meter, speedometer	P2 <i>Number Top-It (Decimals)</i> : SRB p256, MM p490&506 <b>PE 4.1.E</b>		Estimate sums of decimals and explain strategy. <b>PE 4.2.H &amp; 3.1.D</b>	
4♦5	<p><b>5.2.F</b> Fluently and accurately add and subtract decimals.</p> <p><b>5.2.G</b> Estimate sums and differences of fractions, mixed numbers, and decimals to approximate solutions to problems and determine reasonableness of answers.</p> <p><b>5.6.H</b> Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.</p>	Use 0 as a placeholder in decimals to facilitate use of addition and subtraction algorithms. <b>PE 5.2.F</b>	<b>Skip this lesson.</b> Addition and subtraction of decimals not only is a 5 <sup>th</sup> grade standard but also should be introduced with a concrete model and not with algorithm, as in this lesson.			MM p118, 1 per 4 students, cut apart	Identify values of decimal digits. <b>PE 5.2.G &amp; 5.6.H</b>	TLG p264, “Explain how you found the value of S in No. 4e.”
4♦6	<p><b>3.1.A</b> Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols.</p> <p><b>4.4.E</b> Determine the median, mode, and range of a set of data and describe what each measure indicates about the data.</p> <p><b>5.2.F</b> Fluently and accurately add and subtract decimals.</p> <p><b>5.5.C</b> Construct and interpret line graphs.</p>	Share and justify strategies for addition and subtraction of decimals. <b>PE 5.2.F</b>	Consider using money manipulatives as a resource. Use calculators for “Maintaining a Savings Account” and Math Boxes with decimals.	deposit, withdrawal, balance, interest	P2 <i>Name That Number</i> . SRB p254, MM p489 <b>PE 4.4.A &amp; 5.5.C</b>		Identify data landmarks. <b>PE 4.4.E</b>	

4♦7	<p><b>3.1.A</b> Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols.</p> <p><b>4.2.A</b> Represent decimals through hundreds with place value models, fraction equivalents, and the number line.</p> <p><b>4.2.B</b> Read, write, compare, and order decimals through hundredths.</p>	<p>Relate fractions and decimals as part of a whole represented as a cube. <b>PE 4.2.A▲</b></p>	<p><b>Note:</b> The ONE changes from a flat, to a BIG cube in this lesson. "World Tour Option: Visiting Africa" is optional. Have students use calculators to solve math box #5</p>	<p>thousandth</p>	<p>P3EP <i>Base-10 Exchange</i>: SRB p456, MM p458-9 <b>PE 3.1.A</b></p>	<p>Label one of each of the base-10 blocks: big cube, flat, long and cube.</p>	<p>Write decimals through hundredths. <b>PE 4.2.B</b></p>	
4♦8	<p><b>2.3.C</b> Measure length to the nearest whole unit in both metric and U.S. customary units.</p> <p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p> <p><b>4.2.A</b> Represent decimals through hundreds with place value models, fraction equivalents, and the number line.</p> <p><b>4.4.B</b> Solve single-and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.</p>	<p>Relate decimals as part of a whole represented as a meter (see note on TLG p279). <b>PE 4.2.A▲ &amp; 4.4.B</b></p>	<p>This lesson is not just about measurement. It is using the metric system because it is a great linear model for place value and a number line. Make this connection explicit and related to previously seen models. See the side note on TLG pg 279. A meter becomes a whole. So 25 cm can be seen as 2 decimeters (which are 2 tenths of a meter) and 5 centimeters (which are 2 hundredths of a meter): 25 cm = 0.25 m. Use a similar activity for lesson 4♦10 but using a centimeter as a whole.</p>	<p>centimeter (cm), meter (m), millimeter (mm), decimeter (dm)</p>	<p>P2 <i>Fishing For Digits</i>: SRB p242, MM p472 <b>PE 4.1.E</b></p>	<p>For Part 1, choose 5 objects or distances for students to measure.</p>	<p>Measure line segments to the nearest centimeter. <b>PE 2.3.C</b></p>	<p>TLG p281, "In No. 6a, explain how you knew which number was closer to 47."</p>
4♦9	<p><b>2.3.A</b> Identify objects that represent or approximate standard units and use them to measure length.</p> <p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p> <p><b>4.2.B</b> Read, write, compare, and order decimals through hundredths.</p>	<p>Identify personal references for metric units of length. <b>PE 2.3.A</b></p>	<p>Have students use calculators for Math Box #1.</p>	<p>personal measurement reference</p>	<p>P2 <i>Number Top-It (Decimals)</i>: SRB p256, MM p490&amp;506 <b>PE 4.1.E</b></p>	<p>For Math Message, choose something in your classroom that measures between 30 and 60 cm. Measure the object, rounding to the nearest 10cm.</p>	<p>Compare decimals through thousandths. <b>PE 4.2.B▲</b></p>	<p>TLG p287, "Explain the strategy you used to order the decimals in No. 2."</p>
4♦10	<p><b>4.1.A</b> Quickly recall multiplication facts through 10 x 10 and the related division facts.</p> <p><b>4.2.A</b> Represent decimals through hundreds with place value models, fraction equivalents, and the number line.</p> <p><b>4.4.B</b> Solve single-and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.</p>	<p>Relate decimals as part of a whole represented as a centimeter. <b>PE 4.2.A &amp; 4.4.B</b></p>	<p>See comment for lesson 4♦8. The only difference is that now the centimeter is the whole. Have students use calculators for Math Box #3.</p>			<p>MM p429 1 per 4 students, cut apart. Enrichment activity uses the book, "If You Hopped Like a Frog".</p>	<p>Demonstrate automaticity of facts. <b>PE 4.1.A</b></p>	
4♦A	<p><b>4.4.B</b> Solve single-and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.</p>	<p>Convert between units within each system, U.S. Customary and Metric. <b>PE 4.4.B</b></p>	<p><b>Supplemental Activities</b> to support unit conversions. Take this opportunity to have students really work towards mastery of this skill. Use <b>Supplement 4♦A: Unit Conversions Part 1</b> to make conversion using a reference. For problem #3 emphasize the meaning of each prefix in the metric system as a way to help with conversion. Make an anchor chart extending the table in problem #3 to show the relationship between units when each of the prefixes is "1". For example, add a row and make deca_ "1". What are the values for the other units? Use <b>Part 2</b> of the same supplement (word problems) as practice without using a reference.</p>	<p>Cup, pint, quart, gallon, inch, foot, yard, mile, milli_, centi_, deci_, deca_, hecto_, kilo_, meter, liter, gram</p>		<p><b>2 Days</b></p>		

Unit 5: Big Numbers, Estimation, and Computation								
<p><b>Overview:</b> To extend multiplication facts and to review the basic principles of multiplication of multidigit numbers; to provide practice estimating and deciding when estimation is appropriate; to review and provide practice with the partial-products algorithm and the lattice method for multiplication, and to provide practice reading, writing, and comparing large numbers using patterns in the base-ten place-value system.</p>								
<p><b>Big Ideas</b>    <b>Estimation:</b> Numerical calculations can be approximated by replacing numbers with other numbers that are close and easy to compute. <b>Properties:</b> Properties of operations and equality are rules for arithmetic and algebra based on relationships that are always true for a given set of numbers. <b>Place Value:</b> The Base-Ten numeration system uses digits 0-9, which repeat in predictable ways and whose values are determined by their position. <b>Comparison:</b> Numbers, expressions and measures can be compared by their relative values using symbols, words or numerical representations (fractions, ratios, and percents).</p>								
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
5♦1	<p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p> <p><b>4.1.G</b> Mentally multiply 2 digit numbers by numbers through 10 and multiples of 10.</p>	<p>Use basic multiplication facts to compute fact extensions (multiples of 10). <b>PE 4.1.G</b></p>	<p>Have students review their multiplication fact goals and evaluate next steps.</p>	<p>extended multiplication facts</p>	<p>P1 <i>Beat the Calculator</i>. SRB p233, MM p461; <b>PE 4.1.G</b> P3R <i>Multiplication Top-It</i>. SRB p264, MM p506 <b>PE 4.1.F</b></p>		<p>Use basic facts to compute fact extensions. <b>PE 4.1.G</b></p>	
5♦2	<p><b>2.1.D</b> Write three-digit numbers in expanded form.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p> <p><b>4.1.G</b> Mentally multiply 2 digit numbers by numbers through 10 and multiples of 10.</p> <p><b>5.2.F</b> Fluently and accurately add and subtract decimals.</p>	<p>Use expanded notation to solve multi-digit multiplication problems. <b>PE 4.1.G &amp; 2.1.D</b></p>			<p>P1 <i>Multiplication Wrestling</i>. SRB p253, MM p488 <b>PE 4.1.F</b></p>	<p>Part 1; Make extra copies of record sheet (MM p488) for Multiplication Wrestling.</p>	<p>Determine whether a number sentence is true or false. <b>PE 5.2.F</b></p>	
5♦3	<p><b>3.1.D</b> Estimate sums and differences to approximate solutions to problems and determine reasonableness of answers.</p> <p><b>3.6.G</b> Explain why a specific problem-solving strategy or procedure was used to determine a solution.</p> <p><b>4.1.D</b> Determine reasonableness of answers.</p> <p><b>4.4.C</b> Estimate and determine elapsed time using a calendar, digital clock, and analog clock.</p>	<p>Estimate sums and elapsed time for driving distances from a travel map. <b>PE 3.1.D &amp; 4.4.C</b></p>		<p>estimation, round</p>	<p>P2 <i>Product Pile-Up</i>. SRB p259 <b>PE 4.1.D</b></p>	<p>MM p143, 1 per 2 students, cut apart.</p>	<p>Explain estimation to solve addition problems. <b>PE 3.1.D &amp; 3.6.G</b></p>	<p>TLG p329, "Explain how you solved No. 5".</p>
5♦4	<p><b>3.2.G</b> Multiply any number from 11 through 19 by a single-digit number using the distributive property and place value concepts.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p> <p><b>4.1.G</b> Mentally multiply 2 digit numbers by 10 and multiples of 10.</p> <p><b>4.1.H</b> Estimate products to approximate solutions to problems and determine reasonableness.</p>	<p>Share and justify strategies to determine magnitude estimates (whether products are in the 10s, 100s, 1,000s, etc.). <b>PE 4.1.H</b></p>		<p>rough estimate, magnitude estimate</p>	<p>P2 <i>Multiplication Wrestling</i>. SRB p253, MM p488 <b>PE 4.1.F</b></p>	<p>MM p147, 1 per 3 students, cut apart. For Part 1, find the total number of 4<sup>th</sup> graders in your school and total enrollment.</p>	<p>Use the Distributive Property of Multiplication over Addition in the context of the partial-products algorithm. <b>PE 3.2.G▲ &amp; 4.1.G</b></p>	<p>TLG p335, "For No.5, explain a shortcut you might use to solve the division problems."</p>
5♦5	<p><b>4.1.C</b> Represent multiplication of a two-digit number by a two-digit number with a place value model.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p>	<p>Use the partial products algorithm to solve multiplication problems with 1-digit multipliers. <b>PE 4.1.C &amp; 4.1.F</b></p>	<p><b>Extension:</b> Spend an entire day on the Readiness activity "Modeling Multiplication with Base-10 Blocks" TLG p341 with 1-digit multipliers. It is extremely important that students develop their concrete understanding of multiplication before moving on to more abstract models (i.e. partial products algorithm). Complete the remaining activities on day two. As you introduce the partial product algorithm, connect each part of the base-10 model to each of the parts of the algorithm. Refer to the document <b>Developmental Approach to Multiplication</b> in your supplemental materials.</p>	<p>partial-products method, partial product</p>		<p><b>2-day Lesson</b> Readiness activity, make transparencies from MM p432-433 for each student and tape together.</p>	<p>Use the partial-products algorithm. <b>PE 4.1.F</b></p>	<p>TLG p341, "Donato said that there is more than one correct answer for each of the estimates in No. 2. Do you agree or disagree? Explain."</p>

5♦6	<p><b>4.1.C</b> Represent multiplication of a two-digit number by a two-digit number with a place value model.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p> <p><b>4.1.H</b> Estimate products to approximate solutions to problems and determine reasonableness of answers.</p> <p><b>4.4.A</b> Represent an unknown quantity in simple expressions, equations, and inequalities using letters, boxes, and other symbols.</p> <p><b>5.5.C</b> Construct and interpret line graphs.</p>	<p>Use the partial products algorithm to solve multiplication problems with 2-digit multipliers. <b>PE 4.1.C &amp; 4.1.F</b></p>	<p><b>Extension:</b> Since this lesson focuses on 2-digit multipliers, it is very important to go back to the concrete model. Again, spend an entire day on the Readiness activity “Modeling Multiplication with Base-10 Blocks” TLG p347. Complete the remaining activities on day two. Again, connect each part of the base-10 model to each of the parts of the algorithm. Refer to the document <b>Developmental Approach to Multiplication</b> in your supplemental materials.</p>		<p><i>P2 Name That Number:</i> SRB p254, MM p489 <b>PE 4.4.A, 5.5.C</b></p>	<p><b>2 Day Lesson</b> Part 1: have MM p403 or p431 available. Readiness activity: same as for Lesson 5♦5.</p>	<p>Estimate reasonable solutions to whole-number multiplication problems. <b>PE 4.1.H</b></p>	<p>TLG p346, “Devon wrote 342,00 for No. 4a. Explain the error he might have made.”</p>
5♦7	<p><b>4.1.A</b> Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p>	<p>Use the Lattice method to solve multiplication problems with 1 and 2-digit multipliers. <b>PE 4.1.F</b></p>	<p><b>This Lesson will be moved to Unit 9.</b> The Lattice Multiplication algorithm is not transparent for most students that struggle with place value and appears to be “magic” to some. Delay the introduction of Lattice until students have a solid understanding of multidigit multiplication. Each time Lattice appears in math boxes and other activities have students compute using a different multiplication algorithm that they are successful with.</p>	<p>lattice, lattice method (for multiplication)</p>	<p><i>P2 Multiplication Top-It:</i> SRB p264, MM p506 <b>PE 4.1.F</b></p>		<p>Demonstrate automaticity with multiplication facts. <b>PE 4.1.A</b></p>	
5♦8	<p><b>3.1.A</b> Read, write, compare, order and represent numbers to 10,000 using numbers, words and symbols.</p> <p><b>4.1.D</b> Determine reasonableness of answers.</p> <p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p> <p><b>8.4.C</b> Evaluate numerical expressions involving non-negative integer exponents using the laws of exponents and the order of operations.</p>	<p>Find patterns in the base-10 system to read numbers in the billions. <b>PE 4.1.E▼</b></p>	<p>Reference the place value books from lessons 2♦4 and 4♦1 for additional practice.</p>	<p>million, billion</p>	<p><i>P3R High Number Toss:</i> SRB p252, MM p487 <b>PE 8.4.C</b></p>	<p>Part 1: Prepare a class Place Value Chart. See TLG p335. Enrichment activity uses the book, <i>How Much is a Million?</i></p>	<p>Use extended multiplication facts in a problem-solving situation. <b>PE 4.1.D▲</b></p>	<p>TLG p359, “Explain how you determined the number of pies for No. 5.”</p>
5♦9	<p><b>2.4.A</b> Solve problems involving properties of two- and three-dimensional figures.</p> <p><b>3.4.C</b> Identify and describe special types of quadrilaterals.</p> <p><b>5.4.A</b> Describe and create a rule for numerical and geometric patterns and extend the patterns.</p> <p><b>7.5.B</b> Write the prime factorization of whole numbers greater than 1, using exponents when appropriate.</p> <p><b>8.4.A</b> Represent numbers in scientific notation, and translate numbers written in scientific notation into standard notation.</p>	<p>Find patterns in the base-10 system to represent place value as powers of ten (exponential notation). <b>PE 5.4.A &amp; 7.5.B▼</b></p>	<p>Start by reading <i>How Much is a Million</i> to connect place value and exponential notation. <b>Touch &amp; Go Lesson:</b> Powers of 10 is an 8<sup>th</sup> grade standard. Introduce exponential notation for powers of 10 as a way of naming the values of places in our base-ten system.</p>	<p>scientific notation, trillion, quadrillion, sextillion, powers of 10, exponent</p>	<p><i>P2 Polygon Pair Up:</i> SRB p258, MM p496-7 <b>PE 2.4.A, 3.4.C</b></p>	<p>Part 1: Prepare a class place value chart MM p166.</p>	<p>Describe numeric patterns. <b>PE 5.4.A</b></p>	<p>TLG p365, “For No. 3, can intersecting lines be perpendicular lines? Explain.”</p>
5♦10	<p><b>3.1.B</b> Round whole numbers through 10,000 to the nearest 10, 100, and 1,000.</p> <p><b>4.1.A</b> Quickly recall multiplication facts through 10 x 10 and the related division facts.</p>	<p>Use strategies to round large numbers to a given place. <b>PE 3.1.B▲</b></p>		<p>rounding (to a certain place)</p>			<p>Demonstrate automaticity with multiplication facts. <b>PE 4.1.A</b></p>	
5♦11	<p><b>4.1.E</b> Compare the values represented by digits in whole numbers using place value.</p> <p><b>8.4.C</b> Evaluate numerical expressions involving non-negative integer exponents using the laws of exponents and the order of operations.</p>	<p>Develop strategies to compare very large whole numbers (World Tour Project) . <b>PE 4.1.E</b></p>	<p>Part 2 “Updating the World Tour” is optional.</p>		<p><i>P3R Number Top-It (7-Digit):</i> SRB p255, MM p492-3&amp;506; <i>P3R High Number Toss:</i> SRB p252, MM p487 <b>PE 8.4.C</b></p>	<p>Readiness: Prepare place value mats, MM p 492-493. TLG p 373.</p>	<p>Compare numbers up to 1 billion. <b>PE 4.1.E</b></p>	

Unit 6: Division; Map Reference Frames; Measures of Angles								
<b>Overview:</b> To provide practice solving multiplication and division number stories; to introduce the division algorithm and the concept of remainders as fractions or decimals; provide practice drawing, measuring, and naming angles using half-circle and full-circle protractors, and to introduce latitude and longitude and to utilize letter-number pairs and ordered pairs on a grid system.								
<b>Big Ideas</b>		<b>Number Relationships:</b> There is an inverse relationship between addition and subtraction operations and between multiplication and division operations when using rational numbers. <b>Measurement &amp; Geometry:</b> Objects and two-dimensional shapes can be quantified, classified, described and analyzed by their attributes and by using unit amounts. <b>Data:</b> Data can be collected, classified, analyzed & displayed using tables, charts & graphs.						
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
6♦1	<p><b>3.2.C</b> Determine products, quotients, and missing factors using the inverse relationship between multiplication and division.</p> <p><b>3.2.H</b> Solve single- and multi-step word problems involving multiplication and division and verify the solutions.</p> <p><b>5.1.C</b> Fluently and accurately divide up to a four digit number by one- or two-digit divisors using the standard long-division algorithm.</p>	Use the inverse relationship between multiplication and division to solve number stories. <b>PE 3.2.C</b>	The organizational diagram is very helpful to students and used throughout the Everyday Mathematics program.	multiplication/division diagram	P3R <i>Division Arrays</i> : SRB p240, MM p470 <b>PE 5.1.C</b>		Write number models to represent number stories. <b>PE 3.2.H</b>	TLG p404, “Explain how you rounded the number in No. 2 to the nearest ten million.”
6♦2	<p><b>5.1.E</b> Mentally divide two-digit numbers by one digit divisors and explain the strategies used.</p> <p><b>7.1.E</b> Solve two-step linear equations.</p> <p><b>8.4.C</b> Evaluate numerical expressions involving non-negative integer exponents using the laws of exponents and the order of operations.</p>	Share and justify strategies to solve division problems. <b>PE 5.1.E▲</b>	Start with the readiness activity “Finding Multiples of 10 and 100” to support <b>PE 4.1.D</b> .	equal-groups notation, quotient, remainder	P3EP <i>Buzz and Bizz-Buzz</i> : SRB p234; P2 <i>High Number Toss</i> : SRB p252, MM p487 <b>PE 8.4.C</b>		Solve open sentences using multiplication and division facts. <b>PE 7.1.E</b>	
6♦3	<p><b>4.1.G</b> Mentally multiply two-digit numbers by numbers through 10 and by multiples of 10.</p> <p><b>5.1.C</b> Fluently and accurately divide up to a 4 digit number by 1 or 2 digit divisors using the standard long division algorithm.</p>	Use partial-quotients algorithm for 1-digit divisors. <b>PE 5.1.C</b>	Although division algorithms are a 5 <sup>th</sup> grade standard, introducing division in 4 <sup>th</sup> grade is appropriate. Before introducing these algorithms, your students must have a strong conceptual understanding of division (i.e. successful completion of EDM models and place value). Allow ample time for this lesson. Start with smaller numbers. Then build up to larger numbers after students get some practice.	dividend, divisor, partial quotient	P3R <i>Beat the Calculator</i> : SRB p233, MM p461; <b>PE 4.1.G</b> P3EP <i>Division Dash</i> : SRB p241, MM p471 <b>PE 5.1.C</b>	MM p403 will be needed throughout the unit. Start with 1 or 2 per student (centimeter grid paper).	Solve division problems and number stories with 1-digit divisors and 2-digit dividends. <b>PE 5.1.C</b>	TLG p417, “Explain how the exponent in No. 4a changes the value of 10.”
6♦4	<p><b>5.1.C</b> Fluently and accurately divide up to a 4 digit number by 1 or 2 digit divisors using the standard long division algorithm.</p> <p><b>5.1.F</b> Solve single- and multi-step word problems involving multi-digit division and verify the solutions.</p> <p><b>5.2.F</b> Fluently and accurately add and subtract decimals.</p>	Interpret remainders within the context of number stories. <b>PE 5.1.F</b>	<b>Touch &amp; Go</b> “Expressing Remainders as Fractions or Decimals”: The 5 <sup>th</sup> grade standard <b>PE 5.1.C</b> only requires students to use “r” notation for expressing remainders.	mixed number	P2 <i>Division Dash</i> : SRB p241, MM p471 <b>PE 5.1.C</b>	Readiness activity, TLG p424. uses the book <i>A Remainder of One</i>	Solve decimal addition and subtraction problems. <b>PE 5.2.F</b>	
6♦5	<p><b>3.5.E</b> Construct and analyze pictographs, frequency tables, line plots, and bar graphs.</p> <p><b>5.3.B</b> Identify, sketch, and measure acute, right, and obtuse angles.</p> <p><b>8.2.D</b> Represent and explain the effect of one or more translations, rotations, reflections, or dilations (centered at the origin) of a geometric figure on the coordinate plane.</p>	Use multiples of 30 to relate elapsed minutes on a clock to rotational degree measures. <b>PE 5.3.B</b>	This is a good introduction to a 5th grade standard. <b>Touch &amp; Go.</b>	rotation, turn, clockwise, degree, right angle	P3EP <i>Robot</i> <b>PE 8.2.D</b>	Same book used as Lesson 6♦4 above.	Create a bar graph. <b>PE 3.5.E</b>	
6♦A	<b>4.4.C</b> Estimate and determine elapsed time using a calendar, a digital clock, and an analog clock.	Use analog clocks to calculate elapsed time between events. <b>PE 4.4.C</b>	<b>Supplemental Lesson</b> to support elapsed time. <b>Gr4 Texas Project #8: Elapsed Time</b> Do all of Part 1. Part 2 could be done as homework.					

6↔6	<p><b>3.4.B</b> Identify and sketch right angles.</p> <p><b>5.3.B</b> Identify, sketch and measure acute, right and obtuse angles.</p>	<p>Use a full-circle protractor to identify angles as less than, equal to or greater than 90°. <b>PE 5.3.B</b></p>	<p>This is a good introduction to a 5th grade standard. <b>Touch &amp; Go.</b></p>	<p>angle (<math>\sphericalangle</math>), sides (of an angle), vertex (of an angle), clockwise rotation, counterclockwise rotation, full-circle protractor</p>	<p>P2 <i>Division Dash</i>: SRB p241, MM p47 <b>PE 5.1.C</b> P3EP <i>Angle Tangle</i>: SRB p230, MM p457 <b>PE 3.4.B, 5.3.B</b></p>	<p>MM p439, make transparencies (1 per 4 students) plus extras</p>	<p>Draw angles less than or greater than 90° <b>PE 5.3.B.</b></p>	<p>TLG p435, "Winnona said there isn't enough information provided in No. 2 to answer the question. Do you agree or disagree? Explain your answer."</p>
6↔7	<p><b>4.2.B</b> Read, write, compare, and order decimals through hundredths.</p> <p><b>5.3.B</b> Identify, sketch and measure acute, right and obtuse angles.</p>	<p>Classify angles according to their measure. <b>PE 5.3.B</b></p>	<p>Emphasize acute, right, and obtuse angles. Touch and go on reflex and straight angles.</p>	<p>acute angle, obtuse angle, reflex angle, straight angle, half-circle protractor, base line</p>		<p>Enrichment activity uses the book, <i>Sir Cumference and the Great Knight of Angleland</i>.</p>	<p>Identify places in decimals and the values of the digits in those places. <b>PE 4.2.B▲</b></p>	<p>TLG p441, "Wei said that both squares in No. 6 have 1/3 shaded. Do you agree or disagree? Explain your answer."</p>
6↔8	<p><b>3.4.B</b> Identify and sketch right angles.</p> <p><b>4.4.D</b> Graph and identify points in the first quadrant of the coordinate plane using ordered pairs</p> <p><b>5.3.B</b> Identify, sketch and measure acute, right and obtuse angles.</p>	<p>Use ordered number pairs to locate points on a coordinate grid. <b>PE 4.4.D</b></p>	<p><b>Modification:</b> Begin with the readiness activity on TLG p447 "Moving on a coordinate Grid". Although the activities on Part 1 cover coordinate grids they do not address the standard appropriately. Play <i>Angle Tangle</i> and do the Math Boxes. Save the Study Link and the other Part 3 activities for later.</p>	<p>index of locations, letter-number pair, ordered number pair, map scale</p>	<p>P2 <i>Angle Tangle</i>: SRB p230, MM p457 <b>PE 3.4.B, 5.3.B</b> P3E <i>Grid Search</i>: SRB p250, MM p486</p>		<p>Compare coordinate grid systems. <b>PE 4.4.D</b></p>	<p>TLG p447, "Explain how to use the <u>in</u> and <u>out</u> numbers in No. 2 to determine the rules."</p>
6↔B	<p><b>4.4.D</b> Graph and identify points in the first quadrant of the coordinate plane using ordered pairs.</p> <p><b>8.4.A</b> Represent numbers in scientific notation, and translate numbers written in scientific notation into standard form.</p>	<p>Use ordered pairs of numbers to name, locate, and plot points in the first quadrant of a coordinate grid. <b>PE 4.4.D</b></p>	<p><b>Supplemental Lesson</b> to support coordinate grids <b>Grade 5 Lesson 9↔1 Hidden Treasure:</b> Begin with Readiness Activity "Finding Locations on a Map" Gr5 TLG p708. Use Study Link from the previous lesson as an additional readiness activity before moving onto Part 1 of this lesson. Do all of Part 1. Skip Part 2.</p>	<p>coordinate grid, axis, origin, ordered pair of numbers, vertical axis, horizontal axis, coordinate</p>	<p>P1 <i>Hidden Treasure</i>: SRB p319, MM p485 <b>PE 4.4.D</b></p>	<p>Part 1 uses Teaching Masters, MM p437, 438, &amp; 485 (for extra Hidden Treasures game boards).</p>	<p>Translate numbers written in scientific notation into standard notation and number-and-word notation. <b>PE 8.4.A</b></p>	<p>TLG p708, "Explain how you solved No. 2d. How might you check your answer?"</p>
6↔9	<p><b>4.1.I</b> Solve single- and multi-step word problems involving multi-digit multiplication and verify the solutions.</p>	<p>Use ordered number pairs to locate points on a coordinate grid. <b>PE 4.4.D</b></p>	<p><b>Modification:</b> Instead of Part 1, do the Enrichment and Extra Practice Activities from lesson 6↔8. Do all of Part 2 for lesson 6↔9 except the Study Link.</p>	<p>sphere, North Pole, South Pole, axis, equator, prime meridian, hemisphere, latitude (lines), parallels, longitude (lines), meridian bar</p>	<p>P2 <i>Over and Up Squares</i>: SRB p257, MM p494 <b>PE 4.4.D</b></p>	<p>Enrichment activity uses the book, <i>Sea Clocks: The Story of Longitude</i>.</p>	<p>Solve multi-digit multiplication number stories. <b>PE 4.1.I</b></p>	
6↔10	<p><b>5.1.C</b> Fluently and accurately divide up to a 4 digit number by 1 or 2 digit divisors using the standard long division algorithm</p> <p><b>5.1.F</b> Solve single- and multi-step word problems involving multi-digit division and verify the solutions.</p>	<p>Use partial-quotients algorithm for 2-digit divisors. <b>PE 5.1.C</b></p>			<p>P3R <i>Division Dash</i>: SRB p241, MM p471 <b>PE 5.1.C</b></p>		<p>Solve problems involving the division of multi-digit whole numbers by 1-digit divisors. <b>PE 5.1.F</b></p>	<p>TLG p459, "True or False" (5, 0) and (0, 5) are both ordered pairs that can be used to describe the location of <u>point A</u> in No. 1. Explain your answer."</p>

Unit 7: Fractions and Their Uses; Chance and Probability								
<p><b>Overview:</b> To review fractions as parts of a whole (ONE), fractions on number lines, and uses of fractions; to guide students as they order fractions and find fractional parts of sets and regions; to provide practice identifying equivalent fractions; and to review basic ideas of probability, comparing predicted and actual results, and guiding the application of fractions to chance experiments. Take advantage of the many part 3 activities that support fraction concepts.</p>								
<p><b>Big Ideas</b>    <b>Number 2:</b> A fraction represents a comparison of a part to the whole (region, set, segment). <b>Number 1:</b> Numbers have a unique point on the number line. Two numbers are equal when they represent the same point on the number line. <b>Chance:</b> The chance of an event occurring can be described numerically by a number between 0 and 1 inclusive and used to make predictions about events.</p>								
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
7♦A	<p><b>3.3.B</b> Compare and order fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.</p> <p><b>3.3.C</b> Represent and identify equivalent fractions with denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.</p> <p><b>4.2.C</b> Convert a mixed number to a fraction and vice versa and visually represent the number.</p> <p><b>4.2.E</b> Compare and order decimals and fractions (including mixed numbers) on the number line, in lists, and with the symbols <math>&lt;</math>, <math>&gt;</math>, or <math>=</math>.</p>	Use region models to determine that mixed numbers make fractions with numerators greater than the denominators. <b>PE 4.2.E▼</b>	<p><b>Optional Supplemental Lesson</b>  <b>Grade 3 Lesson 8♦7 : Fractions Greater than ONE</b>                      Use this lesson for readiness to provide conceptual knowledge of mixed fractions to support <b>PE 4.2.C</b> prior to lesson 7♦1 if necessary.</p>	Mixed Number	<p>P2 <i>Equivalent Fractions Game</i>: SRB p283 <b>PE 3.3.C</b>; P3EP <i>Fraction Top-It</i>: SRB p287 <b>PE 3.3.B</b></p>	MM p436, 1 per 3 students, cut apart.	Use Fraction Cards to find equivalent fractions. <b>PE 3.3.B &amp; 3.3.C</b>	TLG p686, “In No. 5, what does <i>share equally</i> mean?”
7♦1	<p><b>3.3.A</b> Represent fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12 as part of a whole, parts of a set, and points on the number line.</p> <p><b>3.4.C</b> Identify and sketch parallel, intersecting, and perpendicular lines and line segments.</p> <p><b>4.2.F</b> Write a fraction equivalent to a given fraction.</p>	Identify fractions as equal parts of a whole (ONE). <b>PE 3.3.A</b>		whole (or ONE or unit), mixed number, denominator, numerator, “whole” box	<p>P2 <i>Product Pile-Up</i>: SRB p259 <b>PE 4.1.D</b></p>	7♦3 uses regular decks of cards – 1 deck per 2 students.	Describe fractions as equal parts of a whole. <b>PE 2.4.E</b>	TLG p573, “How did you determine whether the angle in No. 2 was obtuse or acute?”
7♦2	<p><b>3.3.A</b> Represent fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12 as part of a whole, parts of a set, and points on the number line.</p> <p><b>6.1.D</b> Fluently and accurately multiply and divide non-negative fractions and explain the inverse relationship between multiplication and division with fractions.</p>	Identify fractions as equal parts of a set (collection). <b>PE 3.3.A</b>	Have plenty of counters for students to solve the fraction-of problems.		<p>P3EP <i>Fraction Of</i>: SRB p244, MM p477-80 <b>PE 6.1.D</b></p>	Part 1 uses 20+ counters per student. For Part 3 (EP) <i>Fraction Of</i> game, consider copying MM p477, 478 and 480 on cardstock.	Solve “Fraction-of” problems. <b>PE 3.3.A</b>	TLG p579, “Describe the relationship between the fraction you chose in No. 1 and the minutes on the clock face.”
7♦3	<p><b>3.1.A</b> Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols.</p> <p><b>4.4.F</b> Describe and compare the likelihood of events.</p> <p><b>6.1.D</b> Fluently and accurately multiply and divide non-negative fractions and explain the inverse relationship between multiplication and division with fractions.</p>	Use basic probability terms to describe the likelihood of an event based on parts of a set (52 cards). <b>PE 4.4.F &amp; 3.3.A</b>	Provide your student frequent opportunities to play <i>Fraction-Of</i> during the rest of the year.	equally likely, outcome, event, probability, favorable outcome	<p>P3EP <i>Grab Bag</i>: SRB p249, MM p483-5 <b>PE 4.4.G</b>; P2 <i>Fraction Of</i>: SRB p244, MM p477-80 <b>PE 6.1.D</b></p>	Part 1 uses decks of cards, 1 per 2 students. For Part 3 (EP) <i>Grab Bag</i> game, consider copying MM p483 & 484 on cardstock.	Use basic probability terms to indicate the likelihood of an event. <b>PE 4.4.F</b>	
7♦4	<p><b>3.3.A</b> Represent fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12 as part of a whole, parts of a set, and points on the number line.</p>	Use pattern blocks to identify fractional parts of different sizes of ONE. <b>PE 3.3.A</b>				Part 1 uses patterns blocks for the partner activity. See TLP p587.	Describe the relationship between the whole and its fractional parts. <b>PE 3.3.A</b>	TLG p590, “Explain how you determined the number of months in No. 3b.”
7♦5	<p><b>3.4.B</b> Identify and sketch right angles.</p> <p><b>5.2.A</b> Represent addition and subtraction of fractions and mixed numbers using visual and numerical models, and connect the representation to the related equation.</p> <p><b>5.3.B</b> Identify, sketch, and measure acute, right, and obtuse angles.</p>	Use pattern blocks to model addition and subtraction of fractions (Hexagon = 1 whole). <b>PE 5.2.A</b>	Although adding and subtracting fractions are 5 <sup>th</sup> grade standards, this lesson provides a strong conceptual/visual approach and supports the work done in 5 <sup>th</sup> grade.		<p>P2 <i>Angle Tangle</i>: SRB p230, MM p457 <b>PE 3.4.B, 5.3.B</b></p>	Part 3 (R) uses the book, <i>Gator Pie</i> . 7♦6 uses the Fraction Cards in SMJ, Activity Sheets 5 & 6.	Use pattern blocks to solve fraction addition problems. <b>PE 5.2.A</b>	

7♦6	<p><b>4.2.F</b> Write a fraction equivalent to a given fraction.</p> <p><b>4.4.G</b> Determine a simple probability from a context that includes a picture.</p> <p><b>5.3.B</b> Identify, sketch, and measure acute, right, and obtuse angles.</p>	<p>Identify equivalent names for fractional parts of a region (Everyday Math Deck). <b>PE 4.2.F</b></p>			<p>P3EP <i>Fraction Match</i>: SRB p243, MM p473-6 <b>PE 3.3.C</b>; P2 <i>Grab Bag</i>: SRB p249, MM p483-5 <b>PE 4.4.G</b></p>	<p>Before lesson, have students prepare Fraction Cards from the back of the Student Journals - cut out and initialed. For Part 3 (EP) <i>Fraction Match</i> game, consider copying MM p473-476 on cardstock.</p>	<p>Estimate the measure of an angle. <b>PE 5.3.B</b></p>	
7♦7	<p><b>3.3.C</b> Represent and identify equivalent fractions with denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.</p> <p><b>4.2.F</b> Write a fraction equivalent to a given fraction.</p>	<p>Develop a rule for generating equivalent fractions. <b>PE 4.2.F</b></p>	<p>Representation (such as the Readiness Activity in part 3) is more important than the rule. Add additional concrete models other than pattern blocks (egg cartons, chocolate bars, fraction strips, etc.) for identifying equivalence.</p>	<p>equivalent fractions, Equivalent Fractions Rule</p>	<p>P2 <i>Fraction Match</i>: SRB p243, MM p473-6 <b>PE 3.3.C</b></p>		<p>Describe a method for determining fraction equivalency. <b>PE 4.2.F</b></p>	<p>TLG p606, "How did you determine the number of squares you needed to circle in No. 1?"</p>
7♦8	<p><b>4.2.D</b> Convert a decimal to a fraction and vice versa, and visually represent the number.</p>	<p>Rename fractions as decimals by finding equivalent fractions with denominators of 10 or 100. <b>PE 4.2.D</b></p>					<p>Rename tenths and hundredths as decimals with the assistance of a visual model. <b>PE 4.2.D</b></p>	<p>TLG p613, "Explain how you solved No. 2."</p>
7♦9	<p><b>3.3.D</b> Solve single- and multi-step word problems involving comparison of fractions and verify the solutions.</p> <p><b>4.2.E</b> Compare and order decimals and fractions (including mixed numbers) on the number line, lists, and the symbols less than, greater than (add symbols), or =.</p> <p><b>4.5.E</b> Select and use one or more appropriate strategies to solve a problem and explain why that strategy was chosen.</p>	<p>Share and justify strategies to compare and order fractions. <b>PE 4.2.E &amp; 4.5.E</b></p>			<p>P2 <i>Over and Up Squares</i>: SRB p257 <b>PE 4.4.D</b>; P3EP <i>Fraction Top-It</i>: SRB p247, MM p506 <b>PE 4.2.E, 3.3.D</b></p>	<p><b>Possible 2-day Lesson</b> Part 2 <i>Playing Over and Up Squares</i> will provide additional practice with coordinate grids.</p>	<p>Compare fractions and explain strategies. <b>PE 3.3.D</b></p>	<p>TLG p619, "Explain why 2/2 inch might have been given as a possible answer in No. 3."</p>
7♦10	<p><b>3.1.D</b> Estimate sums and differences to approximate solutions to problems and determine reasonableness of answers.</p> <p><b>3.3.A</b> Represent fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12 as parts of a whole, parts of a set, and points on the number line.</p> <p><b>3.3.D</b> Solve single- and multi-step word problems involving comparison of fractions and verify the solutions.</p> <p><b>4.2.E</b> Compare and order decimals and fractions (including mixed numbers) on the number line, in lists, and with the symbols &lt;, &gt;, or =.</p>	<p>Determine the ONE from a given part of a whole or set. <b>PE 3.3.A</b></p>			<p>P3E <i>Getting to One</i>: SRB p248 <b>PE 3.1.D</b>; P2 <i>Fraction Top-It</i>: SRB p247, MM p506 <b>PE 4.2.E, 3.3.D</b></p>		<p>Compare fractions and write a number model to illustrate the comparison. <b>PE 4.2.E</b></p>	<p>TLG p624, "Describe two different ways to check you answer for No. 5."</p>
7♦11	<p><b>4.4.G</b> Determine a simple probability from a context that includes a picture.</p> <p><b>4.4.H</b> Display the results of probability experiments and interpret the results.</p>	<p>Use a variety of probability terms when making predictions and summarizing results from an experiment. <b>PE 4.4.H &amp; 4.4.G.</b></p>	<p>Instead of having students do the Study Link involving making drawings of their Kitchen Layout (which will be required for lesson 8♦1), do one of your own kitchen or use the one provided in the margin of TLG p660</p>	<p>fair (die or spinner), equal chance, expect, equally (more, less) likely</p>	<p>P2 <i>Chances Are</i>: SRB p236, MM p462-6 <b>PE 4.1.G</b></p>	<p>For Part 2 <i>Chances Are</i> game, consider copying MM p462-3 &amp; p465-6 on cardstock. Part 3 (E) uses the book, <i>Do You Wanna Bet?</i></p>	<p>Express the probability of an event as a fraction. <b>PE 4.4.H</b></p>	
7♦12	<p><b>4.4.G</b> Determine a simple probability from a context that includes a picture.</p> <p><b>4.4.H</b> Display the results of probability experiments and interpret the results.</p> <p><b>4.5.J</b> Make and test conjectures based on data (or information) collected from explorations and experiments.</p>	<p>Compare expected and actual results from a probability experiment as it relates to sample size (50 vs. 1,000; See Part 3 (E)). <b>PE 4.4.H &amp; 4.4.G</b></p>	<p>Part 3 Enrichment section of this lesson extends the experiment by compiling all the data from the class. This is a very short extension that can add a lot of depth to the discussion, so it is definitely worth doing.</p>			<p>For the Part 1 <i>Cube-Drop</i> Experiment, boxes would help control the dropping balls – see TLG p632.</p>	<p>Predict the outcomes of an experiment and test the predictions using manipulatives. <b>PE 4.4.G &amp; 4.5.J</b></p>	<p>TLG p636, "Explain the strategy you used to decide which fraction was greater in No. 2e."</p>

Unit 8: Perimeter and Area								
Overview: To review perimeter and area concepts; to develop formulas as mathematical models for the areas of rectangles, parallelograms, and triangles; and to explore applications of area with scale drawings								
Big Ideas		<b>Measurement &amp; Geometry:</b> Objects and two-dimensional shapes can be quantified, classified, described and analyzed by their attributes and by using unit amounts. <b>Patterns:</b> Generalizations can be made and relationships can be described mathematically for situations that have numbers or objects that repeat in predictable ways. <b>Properties:</b> Properties of operations and equality are rules for arithmetic and algebra based on relationships that are always true for a given set of numbers.						
Performance Expectations		Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
8♦1	<b>3.3.C</b> Represent and identify equivalent fractions with denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12. <b>4.2.D</b> Convert a decimal to a fraction and vice versa and visually represent the number. <b>5.3.F</b> Determine the perimeters and areas of triangles and parallelograms	Determine possible lengths of sides of a triangle with a given perimeter. <b>PE 5.3.F</b>	<b>Modification:</b> For Part 1 activity “Analyzing Kitchen Arrangements” use your own Kitchen Layout as a demo instead of having student do their own SMJ p221. Then move on the next activity and focus on completing and discussing SMJ p222.	time-and-motion study, work triangle, perimeter	P2 <i>Fraction Match</i> : SRB p243, MM p473-6 <b>PE 3.3.C</b>	Students bring completed Study Link 7♦11. Read <b>Planning Ahead</b> TLG p663 and review TLG p670 for display details.	Rename fractions with denominators of 10 and 100 as decimals and percents. <b>PE 4.2.D</b>	TLG p662, “Explain how you solved Problem 4.”
8♦2	<b>5.5.C</b> Construct and interpret line graphs. <b>7.2.D</b> Make scale drawings and solve problems related to scale	Use ¼-inch grid paper to make a scale drawing of the classroom (rectangle only). <b>PE 7.2.D▼</b>	<b>Modification:</b> Instead of Part 1, do the Enrichment Activity from Lesson 3♦1 “Solving a Perimeter Problem” using MM p74. Do all of Part 2.	rough floor plan, scale drawing, scale		Read info on p664 if your classroom is larger than 25 X 30 feet.	Use data to create a line graph. <b>PE 5.5.C</b>	
8♦3	<b>3.3.D</b> Solve single- and multi-step word problems involving comparison of fractions and verify the solutions. <b>4.2.E</b> Compare and order decimals and fractions (including mixed numbers) on the number line, in lists, and with the symbols <, >, or =. <b>4.3.B</b> Determine the approximate area of a figure using square units.	Estimate the area of polygons by counting squares. <b>PE 4.3.B</b>	Have students share their strategies for finding the area on SMJ p.227 (i.e. rectangle enclosures, counting squares, inside rectangle) to support <b>PE 4.3.B</b> . Utilize the readiness activity and extra practice if your students need additional support.	area, square units	P2 <i>Fraction Top-It</i> : SRB p247, MM p506 <b>PE 4.2.E, 3.3.D</b>	For Part 1, display prepared unit squares, directions on TLG p663. See TLG p670.	Count whole squares and half squares to find the area of a polygon <b>PE 4.3.B</b>	TLG p673, “Describe the strategy you used in Problem 2c to decide which fraction, 4/8 or 7/15, is greater.”
8♦4	<b>4.3.B</b> Determine the approximate area of a figure using square units.	Estimate the area of an irregular shape by counting squares and combining square pieces. <b>PE 4.3.B</b>	The focus of this lesson is for students to estimate the area of their traced hand. Skip question #3, TLG p676. Utilize the readiness activity if your students need additional support. It is a good visual model of square units and gaps.			For Part 1, MM p444, 3 per student.	Count unit squares and fractions of unit squares to estimate the area of an irregular figure. <b>PE 4.3.B</b>	TLG p679, “Describe the strategy you used to estimate the product in Problem 4.”
8♦5	<b>4.3.C</b> Determine the perimeter and area of a rectangle using formulas, and explain why the formulas work	Use patterns in a table to develop a formula for the area of a rectangle. <b>PE 4.3.C</b>	Make connection for students between arrays in multiplication and area. Play <i>Rugs and Fences</i> from Lesson 8♦7. Do enrichment “Exploring the Relationship between the Perimeter and Area of a Rectangle” to support <b>PE 4.3.E</b> .	length, base, width, height, area, formula, variable	P3E <i>Rugs and Fences</i> : SRB p260, MM p498-502 <b>PE 4.3.B, 4.3.C</b>	For Part 1, prepare class table on TLG p681.	Calculate the perimeter of a figure when the length of one side is missing. <b>PE 4.3.C</b>	

8♦6	<p><b>4.3.D</b> Determine the areas of figures that can be broken down into rectangles.</p> <p><b>5.2.E</b> Fluently and accurately add and subtract fractions, including mixed numbers.</p> <p><b>5.3.D</b> Determine the formula for the area of a parallelogram by relating it to the area of a rectangle.</p> <p><b>6.1.D</b> Fluently and accurately multiply and divide non-negative fractions and explain the inverse relationship between multiplication and division with fractions.</p>	<p>Use grid paper cut outs to develop a formula for area of a parallelogram. <b>PE 5.3.D</b></p>	<p><b>Skip</b> all of Part 1 in lessons 8♦6, 8♦7, and 8♦8, except those activities listed below:                  8♦6: Play <i>Fraction-Of</i>; 8♦7: "Solving Fraction Problems" SMJ p.243 and Math Boxes; 8♦8: Play <i>Grab Bag</i>                  Also take some time to review area and perimeter, specially of composite figures to support <b>PE 4.3.D</b> by using Gr4 <b>Singapore</b> Extra Practice p61-70</p>	<p>base, height, perpendicular</p>	<p>P2 <i>Fraction Of</i>. SRB p244, MM p477-80 <b>PE 6.1.D</b></p>	<p>For Part 1, 2 short straws (equal length), 2 long straws (equal length) and 4 twist-ties per student. Have students complete MM p262 before Lesson 9♦1.</p>	<p>Solve fraction addition and subtraction problems. <b>PE 5.2.E</b></p>	
8♦7	<p><b>4.3.B</b> Determine the approximate area of a figure using square units.</p> <p><b>4.3.C</b> Determine the perimeter and area of a rectangle using formulas, and explain why the formulas work.</p> <p><b>5.3.E</b> Determine the formula for the area of a triangle by relating it to the area of a parallelogram.</p> <p><b>5.3.F</b> Determine the perimeters and areas of triangles and parallelogram</p>	<p>Use previous proofs for area of parallelograms to develop formula for area of triangle. <b>PE 5.3.E</b></p>		<p>equilateral triangle, isosceles triangle, base, height</p>	<p>P3E <i>Rugs and Fences</i>. SRB p260, MM p498-502 <b>PE 4.3.B, 4.3.C</b></p>	<p>For Part 3 (EP), MM p498-501 <i>Rugs and Fences</i> cards on cardstock, cut apart. Also used in Lesson 9♦2.</p>	<p>Describe a strategy for finding and comparing the areas of a square and a polygon. <b>PE 5.3.F</b></p>	<p>TLG p697, "For Problem 4, write two probability questions for which the correct answer would be D – 210 times."</p>
8♦8	<p><b>4.3.B</b> Determine the approximate area of a figure using square units.</p> <p><b>4.4.G</b> Determine a simple probability from a context that includes a picture.</p>	<p>Use grid paper to find the area of irregular shapes (World Tour Project). <b>PE 4.3.B</b></p>			<p>P2 <i>Grab Bag</i>. SRB p249, MM p483-5 <b>PE 4.4.G</b></p>	<p>If doing alternative activity, copies of MM p443 and SRB p286-7 (See Commentary)</p>	<p>Calculate and express the probability of an event as a fraction. <b>PE 4.4.G▲</b></p>	<p>TLG p702, "Explain the strategy you used to solve Problem 4d."</p>

Unit 9: Fractions, Decimals, and Percents								
Overview: To reinforce naming equivalencies among fractions, decimals, and percents; to reinforce the use of a data table, guide the organization and tabulation of survey data, and rank and compare data reported as percents and; to introduce multiplication and division of decimals by whole numbers.								
Big Ideas Equivalence 1: Any number, measure, numerical expression or equation can be represented in multiple ways. Number 1: Numbers have a unique point on the number line. Two numbers are equal when they represent the same point on the number line.								
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
9♦1	<p><b>3.3.C</b> Represent and identify equivalent fractions with denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.</p> <p><b>4.2.D</b> Convert a decimal to a fraction and vice versa, and visually represent a number.</p>	Use hundred-grid to find equivalent names for fractions (100 denominator), decimals and percents. <b>PE 4.2.D▲</b>	Although 4 <sup>th</sup> grade only requires conversions between decimals and fractions the concepts of fractions, decimals and percents are so interlinked that they should not be taught separately. It is appropriate to introduce percents at this point.	percent; 100% box	<i>P2 Fraction Match.</i> SRB p243, MM p473-6 <b>PE 3.3.C</b>	<b>Planning Ahead:</b> Study link for 9♦1 will be used again in lesson 9♦6.	Find equivalent fractions. <b>PE 4.2.E</b>	
9♦2	<p><b>4.2.D</b> Convert a decimal to a fraction and vice versa, and visually represent a number.</p> <p><b>4.3.B</b> Determine the approximate area of a figure using square units.</p> <p><b>4.3.C</b> Determine the perimeter and area of a rectangle using formulas, and explain why the formulas work.</p>	Use hundred-grid to find equivalent names for easy fractions in decimals and percents. <b>PE 4.2.D▲</b>			<i>P2 Rugs and Fences.</i> SRB p260, MM p498-502 <b>PE 4.3.B, 4.3.C</b>		Rename fourths, fifths, tenths and hundredths as decimals and percents. <b>PE 4.2.D▲</b>	TLG p732, "Explain what would happen if you tripled the lengths of the sides in the rectangle in No. 5."
9♦3	<p><b>4.2.D</b> Convert a decimal to a fraction and vice versa, and visually represent a number.</p> <p><b>6.3.C</b> Represent percents visually and numerically, and convert between the fractional, decimal, and percent representations of a number</p>	Use a calculator to convert fractions to decimals and percents. <b>PE 4.2.D &amp; 6.3.C</b>	Using a calculator to convert fractions to decimal that go beyond hundredths place value is appropriate as exposure since they are not doing the conversion by hand.	terminating decimal, repeating decimal	<i>P2 Fraction and Percent Concentration:</i> SRB p246, MM p481-2 <b>PE 4.2.D</b>	For Part 2, copy <i>Fraction/Percent Concentration Cards</i> , MM p481-482 (cardstock).	Rename fourths, fifths, tenths and hundredths as decimals and percents <b>PE 4.2.D▲</b>	TLG p737, "Mario said, 'Without using a protractor, I estimated that the measure of angle RLA in No. 5 was about 45°.' Explain how Mario might have estimated his answer."
9♦4	<p><b>3.3.A</b> Represent fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12 as parts of a whole, parts of a set, and points on the number line.</p> <p><b>4.2.D</b> Convert a decimal to a fraction and vice versa, and visually represent a number.</p> <p><b>6.3.C</b> Represent percents visually and numerically, and convert between the fractional, decimal, and percent representations of a number.</p>	Use a calculator to convert fractions to decimals and percents. <b>PE 4.2.D &amp; 6.3.C</b>	Note that the 4 <sup>th</sup> grade standard requires conversions of fractions not only with denominators of 10 or 100 but also those that can be easily converted to equivalents of those denominators. For example MM p285 problem #5 ( $17/20 = 85/100$ ). Problem #6 would require 2 steps and therefore appropriate for exposure only. To make the discount number stories on SMJ p256 more appropriate make sure to connect it to finding fractions of a set. For example, 25% of something is the same as $\frac{1}{4}$ of something.	regular price, list price, discount, percent of discount, fraction of discount, sale price, discounted price			Solve "fraction-of" problems. <b>PE 3.3.A</b>	
9♦5	<b>5.1.C</b> Fluently and accurately divide up to a four digit number by one- or two-digit divisors using the standard long-division algorithm.	Use a calculator to convert fractions to decimals and percents. <b>PE 4.2.D &amp; 6.3.C</b>	<b>Optional:</b> Both Part 1 and 2. These activities cover conversions in more detail that what would be appropriate for this grade level. Read <b>Planning Ahead</b> on TLG p749.			Part 3 (ELL) uses store catalogs and advertisements.	Divide a multi-digit whole number by a 1-digit divisor. <b>PE 5.1.C</b>	
9♦6	<p><b>4.1.I</b> Solve single- and multi-step word problems involving multi-digit multiplication and verify the solutions.</p> <p><b>4.2.B</b> Read, write, compare, and order decimals through hundredths.</p> <p><b>4.2.D</b> Convert a decimal to a fraction and vice versa and visually represent the number.</p>	Use calculator conversions to percents to compare fractions with unlike denominators. <b>PE 4.2.D▲ &amp; 4.2.B</b>	Comparing fractions with unlike denominators can be very difficult if the denominators do not have small common multiples. By converting to a decimal (or percent) these comparisons become much more manageable.			Part 3 (R) uses a large quantity of pattern blocks in a clear container for estimation.	Interpret a map scale. <b>PE 4.1.I</b>	

9↗7	<p><b>4.5.F</b> Represent a problem situation using words, numbers, pictures, physical objects, or symbols.</p> <p><b>4.5.I</b> Summarize mathematical information, draw conclusions, and explain reasoning.</p>	Use population data to rank order percentages. (World Tour Project) <b>PE 4.5.F &amp; 4.5.I</b>	<b>Optional:</b> Part 1, do all of Part 2. Most of lesson supports social studies more than math. Ranking percentages essentially becomes ordering whole numbers to 100 ( <b>PE 1.1.E</b> ).	urban, rural, life expectancy, rank		For Part 1, copy MM p293, 2 per student. For Part 3 (ELL) collect old magazines.	Draw conclusions from a data representation. <b>PE 4.5.I</b>	TLG p761, "Use a drawing and Number Models to explain how you found the percent for No. 1e."
5↗7	<p><b>4.1.A</b> Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p><b>4.1.F</b> Fluently and accurately multiply up to a 3-digit number by 1 and 2 digit numbers.</p>	Use the Lattice method to solve multiplication problems with 1 and 2-digit multipliers. <b>PE 4.1.F</b>	Take this time to introduce Lattice as another method for multiplication now that students have had ample time to develop these concepts. Be aware that Lattice has been skipped since it first appeared in EDM in grade 3 so some students might have never seen it.	lattice, lattice method (for multiplication)	<i>P2 Multiplication Top-It.</i> SRB p264, MM p506 <b>PE 4.1.F</b>		Demonstrate automaticity with multiplication facts. <b>PE 4.1.A</b>	
9↗8	<p><b>4.1.H</b> Estimate products to approximate solutions to problems and determine reasonableness of answers.</p> <p><b>4.4.D</b> Graph and identify points in the first quadrant of the coordinate plane using ordered pairs.</p> <p><b>4.4.H</b> Display the results of probability experiments and interpret the results.</p>	Use the Lattice method to solve multiplication problems with 1 and 2-digit multipliers. <b>PE 4.1.F</b>	<b>Modification:</b> Since Lattice has just been introduced use this day as additional practice. Have students use Lattice for Mental Math after they have done their estimates. For Part 1, disregard the decimal point and have students multiply as if they were whole numbers or just give them problems for practice using up to 2-digit by 3-digit numbers. (i.e. For Math Message use 12 cm instead of 1.2 cm.)		<i>P2 Over and Up Squares.</i> SRB p257, MM p494 <b>PE 4.4.D</b>		Estimate the product of a whole number and a decimal <b>PE 4.4.H</b>	TLG p766, "Explain how you solved No. 2b."
9↗9	<p><b>2.4.A</b> Solve problems involving properties of two- and three-dimensional figures.</p> <p><b>3.4.C</b> Identify and describe special types of quadrilaterals.</p> <p><b>5.1.D</b> Estimate quotients to approximate solutions and determine reasonableness of answers in problems involving up to two-digit divisors.</p> <p><b>6.1.F</b> Fluently and accurately multiply and divide non-negative decimals.</p>	Use estimation strategies to check reasonableness of answers when dividing with decimals. <b>PE 5.1.D &amp; 6.1.F</b>	<b>Skip</b> all of Part 1. Play <i>Polygon Pair Up</i> and complete math boxes.		<i>P2 Polygon Pair Up.</i> SRB p258, MM p496-7 <b>PE 2.4.A &amp; 3.4.C</b>		Estimate the quotient of a decimal divided by a whole number. <b>PE 5.1.D</b>	TLG p772, "Draw a parallelogram that has the same area as the one in No. 5. Does your parallelogram have the same perimeter as the one in No. 5? Explain your answer."

Unit 10: Reflections and Symmetry							
Overview: To guide the discovery of basic properties of reflections, involving 2-dimensional figures and the connection with line symmetry; to guide the application of reflections, rotations, and translations; and to introduce addition involving negative integers.							
Big Ideas <b>Transformations:</b> Objects in space can be rotated, translated, reflected and scaled in infinite ways and those transformations can be described mathematically. <b>Patterns:</b> Generalizations can be made and relationships can be described mathematically for situations that have numbers or objects that repeat in predictable ways.							
Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
10♦1 4.3.A Determine congruence of two-dimensional figures. 4.4.D Graph and identify points in the first quadrant of the coordinate plane using ordered pairs.	Use a transparent mirror to move reflected images to specific locations. <b>PE 4.3.A</b>	A focus for this lesson is not just on symmetry but on congruence and how the mirror can help draw congruent figures.	transparent mirror, recessed, image, pre-image, congruent	P2 <i>Over and Up Squares</i> : SRB p257, MM p494 <b>PE 4.4.D</b>	Part 1 uses transparent mirrors for Math Message. Part 3 (E) uses the book <i>Shadows and Reflections</i> .	Plot points in the first quadrant of a coordinate grid. <b>PE 4.4.D</b>	TLG p797, "What strategy did you use to insert the decimal point in No. 4c?"
10♦2 3.3.B Compare and order fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12. 3.4.B Identify and sketch right angles. 4.3.A Determine congruence of two-dimensional figures. 5.3.B Identify, sketch, and measure acute, right, and obtuse angles. 5.3.H Determine the number and location of lines of symmetry in triangles and quadrilaterals.	Use a transparent mirror to find lines of reflection. <b>PE 5.3.H▼</b>	<b>Skip</b> all these lessons. They will be moved to 5 <sup>th</sup> grade. Do all the Math Boxes in these lessons by integrating them into other lessons over a period of time. Skip problems for content which you have not covered.	reflection, line of reflection	P1 <i>Dart Game</i> :7; P1 <i>Pocket-Billiards Game</i> : <b>PE 4.3.A</b> ; P2 <i>Angle Tangle</i> : SRB p230, MM p457 <b>PE 3.4.B, 5.3.B</b>	Part 3 (R) uses supplies and space for painting. <b>Planning Ahead:</b> For Lesson 10♦4, Part 3 (ELL), collect pictures of symmetric objects. See TLG p804.	Compare fractions with like numerators or like denominators; compare fractions to the benchmark ½. <b>PE 3.3.B</b>	
10♦3 4.3.A Determine congruence of two-dimensional figures. 8.2.D Represent and explain the effect of one or more translations, rotations, reflections, or dilations (centered at the origin) of a geometric figure on the coordinate plane.	Use corresponding points on reflected images to determine properties of reflections (distance to line of reflection & congruency). <b>PE 4.3.A▲ &amp; 8.2.D▼</b>		line of reflection			Use a transparent mirror to sketch and describe a reflection. <b>PE 4.3.A</b>	TLG p808, "How did you choose the weight for the cat in No. 5?"
10♦4 5.3.H Determine the number and location of lines of symmetry in triangles and quadrilaterals.	Use transparent mirrors and paper folds to find lines of symmetry. <b>PE 5.3.H</b>		line of symmetry, symmetric, rotation (turn) symmetry			Describe a pattern and use it to solve problems. <b>PE 5.3.H</b>	
10♦5 2.4.A Solve problems involving properties of two- and three-dimensional figures. 3.4.C Identify and describe special types of quadrilaterals. 4.3.A Determine congruence of two-dimensional figures.	Use reflected, translated and rotated symmetry to extend frieze patterns. <b>PE 4.3.A</b>		frieze pattern, reflection (flip), translation (slide) rotation (turn)	P2 <i>Polygon Pair Up</i> : SRB p258, MM p496-7 <b>PE 2.4.A, 3.4.C</b>		Identify and sketch an example of a reflection and identify examples of translations and rotations. <b>PE 4.3.A▲</b>	TLG p819, "Calculate the mean number of hours Julia babysat last week and explain your strategy."
10♦6 4.4.H Display the results of probability experiments and interpret the results. 7.1.B Represent addition, subtraction, multiplication, and division of positive and negative integers visually and numerically.	Use a money model to add positive and negative numbers. <b>PE 7.1.B</b>		<b>Skip</b> Part 1. Do Part 2 "Solving Fraction, Decimal and Percent Problems" TLG p826 and Math Boxes #1, 3 and 4.	opposite (of a number), credit, debit	P1 <i>Credits/Debits Game</i> : SRB p238, MM p468 <b>PE 7.1.B</b>	Part 1, Math Message, MM p320; 1 per 2 students. Part 3 (R #2), create a life-sized number line, -10 to +10 on the floor. Advanced Prep for Progress check Open Response, students will need the Pentominos; MM p205, cut apart.	Express the probability of an event as a fraction. <b>PE 4.4.H</b>

Unit 11: 3-D Shapes, Weight, Volume, and Capacity								
<b>Overview:</b> To review grams and ounces as units of weight, to identify geometric solids, given their properties, to review concepts and units of capacity and volume; and to introduce subtraction involving positive and negative integers.								
<b>Big Ideas</b>		<b>Number Relationships:</b> There is an inverse relationship between addition and subtraction operations and between multiplication and division operations when using rational numbers. <b>Measurement &amp; Geometry:</b> Objects and two-dimensional shapes can be quantified, classified, described and analyzed by their attributes and by using unit amounts.						
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
11♦1	<p><b>3.5.C</b> Estimate, measure, and compare weight and mass using appropriate-sized U.S. customary and metric units.</p> <p><b>4.3.A</b> Determine congruence of two-dimensional figures.</p>	Use known weights as reference for estimating weights of other objects. <b>PE 3.5.C▲</b>	<b>Touch &amp; Go:</b> Some of this material is good review and some is exposure to conversions between systems. Focus on the differences in scale between the systems rather than in the mastery of conversion. Part 2 World Tour is optional.	gram, ounce		One nickel per student for Math Message. Gather different kinds of scales for 'Gram and Ounce' Museum in Part 1. See Note on TLG p850. <b>Planning Ahead:</b> 11♦2 requires geometric solids. See TLG p853, MM p449-451.	Describe a translation. <b>PE 4.3.A</b>	
11♦2	<b>6.4.G</b> Describe and sort polyhedra by their attributes: parallel faces, types of faces, number of faces, edges, and vertices.	Identify parts of geometric solids. <b>PE 6.4.G</b>	Although these lessons align with 6 <sup>th</sup> grade standards this content reviews and builds a strong foundation for future middle school work in an area that has not been frequently revisited in the standards. This content is appropriate for 4 <sup>th</sup> grade. Focus on vocabulary.	geometric solid, rectangular prism, cylinder, triangular prism, cone, sphere, square pyramid, face, congruent, curved surface, edge, vertex (vertices) cube, flat surface		For Part 1, construct a cube with twist-ties and straws. Prepare straws and twist-ties for students. See TLG p854.	Describe a rectangular prism. <b>PE 6.4.G</b>	TLG p858 "For No. 6, how would you determine the number of calories in 3 ½ bagels?"
11♦3	<p><b>4.1.B</b> Identify factors and multiples of a number.</p> <p><b>4.1.G</b> Mentally multiply two-digit numbers by numbers through 10 and by multiples of 10.</p> <p><b>6.4.D</b> Recognize and draw two-dimensional representations of three-dimensional figures.</p>	Use riddles to identify and classify polyhedrons. <b>PE 6.4.D▲</b>		pyramid, prism, polyhedron, regular polyhedron, triangular pyramid (tetrahedron) dodecahedron		Use the solids from 11♦2 plus a triangular pyramid and a cube from MM p452 & 453. Gather materials for Part 3 (R), see TLG p860.	Find multiples of whole numbers less than 10. <b>PE 4.1.B &amp; 4.1.G</b>	
11♦4	<p><b>4.1.A</b> Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p><b>6.4.E</b> Determine the surface area and volume of rectangular prisms using appropriate formulas and explain why the formulas work.</p> <p><b>7.1.B</b> Represent addition, subtraction, multiplication, and division of positive and negative integers visually and numerically.</p>	Use cubes to find the volume of a rectangular prism. <b>PE 6.4.E▼</b>	<b>Optional:</b> Part 1. Volume is a 6 <sup>th</sup> grade standard but the material in this lesson is presented in a way that may be accessible to 4 <sup>th</sup> grade students. Skip Part 2.	cubic units, volume, dimensions, surface area	<i>P2 Credits/Debits Game:</i> SRB p238, MM p468 <b>PE 7.1.B</b>	Gather materials for Part 2, see TLG p866, to create a cubic meter model.	Demonstrate automaticity with multiplication facts and proficiency with division facts. <b>PE 4.1.A</b>	TLG p870, "How did you round each number to the nearest tenth in No. 5?"

11♦5	<p><b>4.4.G</b> Determine a simple probability from a context that includes a picture.</p> <p><b>6.4.E</b> Determine the surface area and volume of rectangular prisms using appropriate formulas and explain why the formulas work.</p>	<p>Determine the volume of a rectangular prism by multiplying the number of cubes in the base times the number of layers in the prism. <b>PE 6.4.E</b></p>	<p><b>Combine</b> lessons 11♦5 and 11♦6 into one day. Do selected activities as follows:                  11♦5: Do Math Message and follow-up. The rest of Part 1 is Optional. Part 2, play <i>Chances Are</i>. Do Math Boxes #3, 4 &amp; 6                  11♦6: Skip all of Part 1. Do Part 2 "Summarizing the Gram and Ounce Museum". Do Math Boxes #1, 2, 5 &amp; 6</p>	<p>rectangular prism, volume, formula</p>	<p><i>P2 Chances Are</i>: SRB p236, MM p462-6  <b>PE 4.4.G</b></p>		<p>Find the volume of stacks of centimeter cubes.  <b>PE 6.4.E ▼</b></p>	<p>TLG p876, "Use probability terms to describe the likelihood of each of the events in No. 3. Explain your choice of language."</p>
11♦6	<p><b>4.3.A</b> Determine congruence of two-dimensional figures.</p> <p><b>7.1.B</b> Represent addition, subtraction, multiplication, and division of positive and negative integers visually and numerically.</p>			<p>cup, pint, quart, gallon, capacity</p>	<p><i>P1 Credits/Debits Game</i>: SRB p238, MM p468; <i>P1 Credits/Debits Game (Advanced)</i>: SRB p239, MM p469  <b>PE 7.1.B</b></p>	<p>Part 3 (R), create a life-sized number line, -10 to +10, on the floor.</p>	<p>Identify an example of a rotation.  <b>PE 4.3.A▲</b></p>	
11♦7	<p><b>4.4.B</b> Solve single- and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.</p>	<p>Use a graphic representation (SMJ2 p305) to convert between capacity measurements. <b>PE 4.4.B▲</b></p>				<p>For Part 1, empty milk cartons (pint, quart, ½ gallon &amp; gallon) 1½ cups rice &amp; water. For Part 3 (R), label several containers (A, B, C...). Choose a mid-sized container for the target capacity.</p>	<p>Describe the relationships among U.S. customary units of length and among metric units of length. <b>PE 4.4.B</b></p>	

Unit 12: Rates							
Overview: To introduce rates and provide practice collecting and comparing rate data; to provide practice solving rate problems, to provide practice comparing unit prices and identifying information needed for comparison shopping; and to reflect on this year's World Tour experiences and progress on 50-facts tests.							
Big Ideas		<b>Comparison:</b> Numbers, expressions and measures can be compared by their relative values using symbols, words or numerical representations (fractions, ratios, and percents). <b>Data:</b> Data can be collected, classified, analyzed & displayed using tables, charts & graphs.					
Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
12♦1 6.3.B Write ratios to represent a variety of rates. 6.5.C Compare and order positive and negative integers using the number line, lists, and the symbols <, >, or =.	Use eye-blinking data collected to define rate. PE 6.3.B	Although rates are a 6 <sup>th</sup> grade standard the activities in these lessons provide opportunities for problem solving that requires complex reasoning skills which address the process strand. The material is appropriate for 4 <sup>th</sup> graders and should focus on sharing strategies for problem solving.	rate, per		Before Part 1, study the 'eye-blinking' experiment and decide how best to conduct it. Part 3 (ELL), post chart paper for a 'Rates All Around' Museum.	Write number sentences comparing two numbers between 100 and -100. PE 6.5.C	
12♦2 5.4.B Write a rule to describe the relationship between two sets of data that are linearly related. 5.6.G Explain why a specific problem-solving strategy or procedure was used to determine a solution. 6.3.D Solve single- and multi-step word problems involving ratios, rates, and percents, and verify the solutions. 7.1.B Represent addition, subtraction, multiplication, and division of positive and negative integers visually and numerically.	Use multiplication and division in a rate table to solve word problems. PE 6.3.D▼ & 5.4.B		rate table, unit rate	P2 Credits/Debits Game. SRB p238, MM p468 PE 7.1.B	Prepare Teaching Master or chart of MM p454. Part 3 (R) uses the book, <i>Each Orange Had Eight Slices</i> .	Describe the rule for a pattern and use that rule to solve problems. PE 5.4.B & 5.6.G	TLG p918, "Look carefully at the bag of blocks in No. 5. Describe two events that are equally likely. Express the probability of each event as a fraction."
12♦3 4.4.B Solve single- and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system. 5.5.C Construct and interpret line graphs. 6.6.G Extract and organize mathematical information from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Convert data to more accessible rates to check whether or not it makes sense. PE 4.4.B & 6.6.G	Touch & Go on material about rates. Plan to spend more time on the line graph in order to better support 5 <sup>th</sup> grade PE 5.5.C.			The data in this lesson are from <i>The Compass in Your Nose and Other Astonishing Facts about Humans</i> . The "breaths in a lifetime" data is made up.	Use given data to create a line graph. PE 5.5.C	TLG p924, "In No. 5, explain how you knew that you had listed all of the factors of a number."
12♦4 4.1.J Solve single- and multi-step word problems involving division and verify the solutions. 4.4.A Represent an unknown quantity in simple expressions, equations, and inequalities using letters, boxes, and other symbols. 5.4.C Write algebraic expressions that represent simple situations and evaluate the expressions, using substitution when variables are involved. 5.5.C Construct and interpret line graphs.	Share and justify strategies for calculating and comparing unit prices. PE 4.1.J	Rather than modeling unit prices using formal division of decimals focus on equal sharing and other concrete models to solve these problems. Supply coin manipulatives if necessary.	consumer, products, services, comparison shopping, unit price	P2 Name That Number. SRB p254, MM p489 PE 4.4.A, 5.5.C		Insert parentheses in number sentences to make them true. PE 5.4.C	

12↕5	<p><b>3.3.D</b> Solve single- and multi-step word problems involving comparison of fractions and verify the solutions.</p> <p><b>4.2.E</b> Compare and order decimals and fractions (including mixed numbers) on the number line, in lists, and with the symbols &lt;, &gt;, or =.</p> <p><b>4.2.H</b> Round fractions and decimals to the nearest whole number.</p> <p><b>5.2.H</b> Solve single- / multi-step word problems involving addition and subtraction of whole numbers, fractions (including mixed numbers), and decimals, and verify the solutions.</p>	<p>Use division to calculate unit prices for supermarket items. <b>PE 4.2.H▲</b></p>	<p><b>Skip</b> Part 1, this comparison shopping activity goes beyond a concrete model for unit prices. Formal division of whole numbers should be mastered before moving onto concepts this abstract. Play <i>Fraction Top-It</i>.</p>		<p><i>P2 Fraction Top-It</i>: SRB p247, MM p506 <b>PE 4.2.E, 3.3.D</b></p>		<p>Use scaling to model multiplication and division. <b>PE 5.2.H</b></p>	<p>TLG p934, "Describe how you solved No. 2b and how you might check your answer."</p>
12↕6	<p><b>4.1.A</b> Quickly recall multiplication facts through 10 x 10 and the related division facts.</p> <p><b>5.5.C</b> Construct and interpret line graphs.</p>	<p>Use a line graph of the mean and median of class 50-Facts test scores to analyze progress over time. <b>PE 5.5.C</b></p>	<p>World Tour Activities are <b>Optional</b>. Do 50-Facts Test and wrap-up. Touch &amp; Go on Part 2.</p>				<p>Demonstrate automaticity with multiplication facts through 10 * 10. <b>PE 4.1.A</b></p>	