

Unit 1: Routines, Review and Assessments								
Overview: To explore patterns on number grids; to review telling time, measuring lengths, and using calculators; to review data concepts and make predictions based on data; and to give equivalent names for numbers.								
Big Ideas		Place Value: There is a predictable pattern in the Base-Ten numeration system. The value of the digits 0-9 is determined by their position. Comparison: Numbers can be compared by their relative sizes, by analyzing corresponding place values or by their position on the number-line. Equivalence 2: Numbers represent values that can be put together and taken apart.						
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes
1♦1	1.1.E Write, compare, and order numbers to 120. 2.1.F Compare and order numbers from 0 to 1,000. 3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols.	Order whole numbers to the hundreds. PE 3.1.A		unit	P3R Number Line Squeeze PE 1.1.E	Create a Numbers All Around Museum; see TLG p18. Create brackets for <i>Number-Line Squeeze</i> game.	Extend numerical patterns. PE 2.1.F	
1♦2	2.2.F Create and state a rule for patterns that can be generated by addition and extend the pattern.	Find patterns in a number-grid. PE 2.2.F	After "Reviewing Number-Grid Patterns", use the Readiness Activity if students need additional support working with larger numbers.	number grid, odometer		For Part 3, cover numbers on Number Grid with stick-on notes except for the first two rows. Prepare Tool Kits with numbers.	Extend numerical patterns. PE 2.2.F	
1♦3	2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20. 3.1.A Read, write, compare, order and represent numbers to 10,000 using numbers, words, and symbols	Write whole numbers to the thousands. PE 3.1.A		table of contents, answer key, glossary, index, data bank	P2 <i>Less Than You</i> . SRB p289 PE 2.2.A	Numbers All Around Museum should contain examples of time. Distribute SRBs before Math Message.	Write whole numbers. PE 3.1.A	
1♦4	2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20. 2.3.E Use both analog and digital clocks to tell time to the minute. 2.5.D Select from a variety of problem-solving strategies and use one or more strategies to solve a problem.	Determine appropriate tools for different tasks. PE 2.5.D			P2 <i>Addition Top-It</i> . SRB p270, MM p440 PE 2.2.A	If you don't have a demo clock, draw a clock face in a place the whole class can see it.	Write the time showing digital notation. PE 2.3.E	
1♦5	1.5.A Represent data using tallies, tables, picture graphs, and bar-type graphs. 2.1.A Count by tens or hundreds forward and backward from 1 to 1,000, starting at any number. 3.5.E Construct and analyze pictographs, frequency tables, line plots, and bar graphs.	Make a tally chart and bar graph from gathered data. PE 1.5.A	Provide ample time to complete all of Part 1 to support PE 3.5.E. This is an important introductory lesson for students to construct and analyze frequency tables, line plots and bar graphs. Extend SMJ p6 to include questions that require students to analyze data at a higher level such as "How many children had more than 3 letters in their name?" Have students write one question to be answered from the graph. Students can complete MM p14 to provide additional practice.	tally chart, bar graph, range, mode, maximum, minimum		Possible 2-day Lesson Divide the class pad into two columns: First name and last name. Collect items for Chance Museum (see TLG p41)	Write whole numbers. PE 2.1.A	TLG p40, "Explain the meaning of the equals sign (=) in the sentence $0 + 7 = \underline{\quad}$, in No. 6."
1♦6	3.5.A Determine whether two expressions are equal and use "=" to denote equality. 3.6.F Represent a problem situation using words, numbers, pictures, physical objects, or symbols.	Write equivalent names for numbers. PE 3.5.A & 3.6.F▼	Students need to be able to write numbers in standard and expanded form ($357 = 300 + 50 + 7$) to support PE 2.1.D. Model expanded form as one entry in each of the Name-Collection Boxes. (i.e. for 24, write $20 + 4$, and for 16 write $10 + 6$). Ask students to include one example of expanded form in their future Name-Collection Boxes where appropriate.	name-collection box	P1&2 <i>Name That Number</i> . SRB p299, MM p451 PE 3.5.A	For Part 3 (E), prepare name-collection box posters and write a number on each label. Each student needs: 30P, 10N, 10D, 10Q (1♦10)	Represent equivalent names for numbers. PE 3.5.A & 3.6.F▼	TLG p45, "Explain your strategies for finding the missing numbers on the grid in Problem 2."

1♦7	<p>3.5.A Determine whether two expressions are equal and use “=” to denote equality.</p> <p>4.4.F Describe and compare the likelihood of events.</p>	Describe certain and uncertain events. PE 4.4.F▼	Although this is a 4 th grade standard, this lesson is foundational to support students understanding of probability.		P2 <i>Name That Number</i> : SRB p299, MM p451 PE 3.5.A	Copies of MM p17 by Math Message. Readiness activity uses the book “A Million Fish...” Enrichment activity uses the “I Hate Mathematics! Book”	Use basic terms of probability. PE 4.4.F▼	
1♦8	2.2.C Add and subtract two-digit numbers efficiently and accurately using a procedure that works with all two-digit numbers and explain why the procedure works.	Use a number-grid to find differences. PE 2.2.C	This lesson provides an excellent opportunity for teachers to determine if students are able to use the EDM Counting Up Focus Algorithm learned in 2 nd grade (TRM p106).	difference	P1 <i>Number Grid Difference</i> : SRB p301, MM p21&452 PE 2.2.C		Add and subtract multi-digit numbers. PE 2.2.C	
1♦9	<p>2.1.A Count by tens or hundreds forward and backward from 1 to 1,000, starting at any number.</p> <p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols.</p>	Skip count up and back using a calculator. PE 2.1.A	Calculator use in <i>Beat the Calculator</i> and Skip Counting are appropriate. “Reviewing Calculator Place Value Puzzles” is optional. For SMJ p15, have students solve as many problems as they can in 10 minutes without calculators, then complete whole group with calculator.	decimal point, decimal, make change	P2 <i>Beat the Calculator</i> : SRB p278, MM p446 PE 2.2.A	Practice using the calculators before the lesson. Make a chart. (TLG p55) Copy MM p399-402 money (on green) for 1♦10 & 1♦11.	Solve addition and subtraction problems. PE 2.1.A	
1♦10	<p>2.2.H Name each standard US coin, write its value using the \$ sign and the ¢ sign, and name combinations of other coins with the same total value</p> <p>2.2.I Determine the value of a collection of coins totaling less than \$1.00.</p> <p>3.5.A Determine whether two expressions are equal and use “=” to denote equality.</p> <p>4.2.B Read, write, compare, and order decimals through hundredths.</p>	Identify coin value of digits in dollar and cents (decimal) notation. PE 2.2.H▲	Provide ample time to include all activities in this lesson. This is a good time to assess students’ abilities with counting money – a 2 nd grade standard PE 2.2.H & 2.2.I . The <i>Spinning For Money</i> game in 1♦11 (R) is good for extra practice. In Reviewing the > and < Symbols”, have students read the inequalities from left to right and right to left to support the vocabulary terms.	sale price, regular price, estimate, estimation, calculate	P2 <i>Name That Number</i> : SRB p299, MM p451 PE 3.5.A ; P3R <i>Coin Top-It</i> : SRB p270, MM p403 PE 2.2.I	Part 3 (R) MM p403, 1 per student MM p399 - \$5 bills (E). Collect data for 1♦13; MM p404 Sunrise / Sunset chart (TLG p909-910)	Compare values of coin and bill combinations. PE 2.2.H & 4.2.B	TLG p65, “Explain how you found the median in No. 2.”
1♦11	<p>2.2.H Name each standard US coin, write its value using the \$ sign and the ¢ sign, and name combinations of other coins with the same total value</p> <p>2.2.I Determine the value of a collection of coins totaling less than \$1.00.</p> <p>3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols</p> <p>3.1.D Estimate sums and differences to approximate solutions to problems and determine reasonableness of answers.</p>	Make magnitude estimates using money amounts. PE 3.1.D	Counting money up to \$1.00 is a 2 nd grade standard. If your students have difficulty with amounts greater than \$1, adjust accordingly. Caution: Many students have a misconception that calculating the exact answer and then rounding that calculation is an estimation strategy. Provide ample time for the Math Message Follow-up to help students define how to estimate. One important estimation strategy is to round before calculating. See the 2 blue dot examples at the top of TLG p69 and use SRB p190-194. Model the money example on SRB p191.	Frames-and-Arrows diagram, frame, arrow rule	P3R <i>Spinning For Money</i> : MM p462-3 PE 2.2.H & 2.2.I	Possible 2-day lesson. Copy and cut out the fronts and backs of the play money on MM p399-402	Order whole numbers. PE 3.1.A	TLG p71, “Explain how you figured out what the date will be in two weeks for No. 6.”
1♦12	<p>2.2.C Add and subtract two-digit numbers efficiently and accurately using a procedure that works with all two-digit numbers and explain why the procedure works.</p> <p>2.2.F Create and state a rule for patterns that can be generated by addition and extend the pattern.</p>	Use operation rules to complete a Frames-and-Arrows diagram. PE 2.2.F▲		elapsed time	P2 <i>Number Grid Difference</i> : SRB p301, MM p21&452; PE 2.2.C	Make a transparency of MM p27	Solve problems involving number patterns. PE 2.2.F	
1♦13	<p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>4.4.C Estimate and determine elapsed time using a calendar, a digital clock, and an analog clock.</p>	Share and justify strategies for finding elapsed time. PE 4.4.C	Optional: The Sunrise-Sunset Project / Length of Day activities. These activities support the 4 th grade PE 4.4.C on time. Do Telling Time and Calculating Elapsed Time as well as all of Part 2. As part of High Leverage Moves, have more than one student not only share, but to also explain why or how they determined their responses.	unit	P2 <i>Addition Top-It</i> : SRB p270, MM p440 PE 2.2.A	Possible 2-day lesson. Draw a table on the board with the sunrise/sunset data you collected. Prepare Sunrise / Sunset chart.	Demonstrate automaticity with basic addition facts. PE 2.2.A	

Unit 2: Adding and Subtracting Whole Numbers									
Overview: To review fact families and number families; to review and solve “What’s My Rule?” problems; to use diagrams to help solve number stories; and to review algorithms for adding and subtracting.									
Big Ideas		Equivalence 2: Numbers represent values that can be put together and taken apart. Patterns: Patterns repeat and can be extended in predictable ways. Properties: Properties of operations and equality are rules based on relationships that are always true.							
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes	
2♦1	<p>1.2.D Demonstrate the inverse relationship between addition and subtraction by undoing an addition problem with subtraction and vice versa.</p> <p>2.1.A Count by tens or hundreds forward and backward from 1 to 1,000, starting at any number.</p> <p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>2.2.D Add and subtract two-digit numbers mentally and explain the strategies used.</p>	<p>Use properties of addition and subtraction to develop automaticity. PE 1.2.D</p>	<p>If your students are not secure with their addition and Subtraction facts with automaticity, PE 2.2.A, provide strategy instruction to support practice until mastery. Fact Triangles can be used to increase speed but are not an appropriate practice tool if students do not already know the facts.</p>	<p>unit box, label, measurement unit, fact family, turn-around rule, number family</p>	<p>P3E <i>Roll to 100</i>. SRB p307, MM p456 PE 2.2.D</p>	<p>If needed, copy MM p36-37 onto cardstock (Fact Triangles). 2♦6 requires classroom US map. Collect extreme temperature data for 5 days (TLG p105)</p>	<p>Write whole numbers. PE 2.1.A</p>		
2♦2	<p>1.2.D Demonstrate the inverse relationship between addition and subtraction by undoing an addition problem with subtraction and vice versa.</p> <p>2.2.C Add and subtract two-digit numbers efficiently and accurately using a procedure that works with all two-digit numbers and explain why the procedure works.</p> <p>3.5.A Determine whether two expressions are equal and use “=” to denote equality.</p>	<p>Create patterns from addition and subtraction facts to solve problems with larger numbers. PE 2.2.C</p>	<p>Before students complete SMJ p32, review that “=” means equal no matter where it appears. (“i.e. $___ = 12 - 7$ is the same as $12 - 7 = ___$.”)</p>	<p>Fact extension</p>	<p>P3E <i>Name That Number</i> (Multiples of 10): SRB p299 PE 3.5.A</p>		<p>Know basic facts and fact families. PE 1.2.D</p>		
2♦A	<p>2.2.C Add and subtract two-digit numbers efficiently and accurately using a procedure that works with all two-digit numbers and explain why the procedure works.</p> <p>3.1.C Fluently and accurately add and subtract whole numbers using the standard regrouping algorithms.</p>	<p>Share and justify strategies for addition of 2-digit whole numbers. PE 2.2.C & 3.1.C</p>	<p>Supplemental Activity Invented Addition Algorithms Have students solve an addition problem (i.e. 38+44) independently. For students who finish quickly, encourage them to solve the problem in a different way. As students share, record their strategies on anchor charts. Conclude with a discussion to identify similarities and differences between strategies. Repeat process with different problems, encouraging students to try a different strategy each time. A 3rd grade goal is to provide students multiple opportunities to explore a variety of strategies, identify and use strategies they are most comfortable with, and to become flexible when solving computation problems. Before you do these activities, review the section on Algorithms in your Teacher’s Reference Manual p95+ and p102-105 (Addition).</p>						
2♦3	<p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>2.2.F Create and state a rule for patterns that can be generated by addition and extend the pattern.</p>	<p>Use operation rules to complete function tables. PE 2.2.F▲</p>	<p>Differentiation: If your students struggle with Function Machine problems, consider using the Readiness activity (TLG p 116) as a regular routine.</p>	<p>function machine, input, output, rule, “What’s my rule?”</p>	<p>P2 <i>Beat the Calculator</i>. SRB p278, MM p446 PE 2.2.A</p>	<p>Discuss the meaning of the word bacteria to prepare for Math Message.</p>	<p>Write and use rules for functions involving addition and subtraction. PE 2.2.F▲</p>	<p>TLG p115, “Explain your strategy for No. 4.”</p>	
2♦4	<p>3.1.E Solve single- and multi-step word problems involving addition and subtraction of whole numbers and verify the solutions.</p> <p>3.6.F Represent a problem situation using words, numbers, pictures, physical objects, or symbols.</p>	<p>Use parts-and-total diagram to interpret word problems and write an equation (number model). PE 3.1.E & 3.6.F▼</p>	<p>Create a class Anchor Chart of the Guide to Solving Number Stories MM p406. Add strategies that your class discovers throughout the school year. Start with Parts-and-Total diagram.</p>	<p>parts-and-total number story, parts-and-total diagram, number model.</p>		<p>Post the Guide to Solving Number Stories from MM p406. Prepare “<i>What’s My Rule?</i>” tables ahead of time, MM p41</p>	<p>Write number models. PE 3.1.E</p>	<p>TLG, p121, “Explain how you found the numbers for the first two and the last two frames in No. 4.”</p>	

2♦B	<p>2.2.C Add and subtract two-digit numbers efficiently and accurately using a procedure that works with all two-digit numbers and explain why the procedure works.</p> <p>3.1.C Fluently and accurately add and subtract whole numbers using the standard regrouping algorithms.</p>	<p>Subtract whole numbers fluently and accurately. PE 2.2.C & 3.1.C</p>	<p>Supplemental Activity: Invented Subtraction Algorithms</p> <p>Have students solve a subtraction problem (i.e. $76 - 29 =$) independently. For students who finish early, encourage them to solve the problem in a different way. As students share, record their strategies on anchor charts. Conclude with a discussion to identify similarities and differences between strategies. Repeat process with different problems, encouraging students to try a different strategy each time. A 3rd grade goal is to provide students multiple opportunities to explore a variety of strategies, identify and use strategies they are most comfortable with, and are flexible when solving computation problems. Before you do these activities, review the section on Algorithms in your Teacher's Reference Manual p95+ and p105-107 (Subtraction).</p>					
2♦5	<p>2.2.C Add and subtract two-digit numbers efficiently and accurately using a procedure that works with all two-digit numbers and explain why the procedure works.</p> <p>3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols</p> <p>3.1.E Solve single- and multi-step word problems involving addition and subtraction of whole numbers and verify the solutions.</p> <p>3.6.F Represent a problem situation using words, numbers, pictures, physical objects, or symbols.</p>	<p>Use change-to diagram to interpret word problems and write an equation. PE 3.1.E & 3.6.F▼</p>	<p>This is another good opportunity for your students to practice a variety of strategies for subtraction including Counting Up. Model the difference between equations and algorithms (See TLG p126). Equations must include the "=" sign.</p>	<p>change diagram, change-to-more number story, deposit, change-to-less number story, withdraw</p>	<p><i>P2 Number Grid Difference:</i> SRB p301, MM p21&452 PE 2.2.C</p>		<p>Express the values of digits. PE 3.1.A</p>	
2♦C	<p>3.5.B Measure temperature in degrees Fahrenheit and degrees Celsius using a thermometer.</p>	<p>Measure temperature in degrees Fahrenheit. PE 3.5.B</p>	<p>Supplemental Lesson to support measuring temperature PE 3.5.B. Gr3 Texas Project #8: Temperature. Complete all of Part 1.</p>	<p>degrees Fahrenheit (°F), degrees & Celsius (C°)</p>				
2♦6	<p>3.1.E Solve single- and multi-step word problems involving addition and subtraction of whole numbers and verify the solutions.</p> <p>3.6.F Represent a problem situation using words, numbers, pictures, physical objects, or symbols.</p>	<p>Use comparison diagram to interpret word problems and write an equation. PE 3.1.E & 3.6.F▼</p>	<p>Modification: When introducing the National High/Low Temperatures Project, which supports comparison number stories and provides additional practice with subtraction, use the Supplement 2♦6 Document July 2008 Highs and Lows also found at http://www.usatoday.com/weather/news/extremes/2008-07-extremes.htm to ensure only positive whole numbers are used, rather than having students collect the data throughout the year.</p>	<p>comparison number story, comparison diagram</p>		<p>Look at Planning Ahead in Lesson 2♦1 p105 in the TLG for preparation for the National High/Low Temperatures Project</p>	<p>Write number stories. PE 3.1.E</p>	
2♦7	<p>2.1.B Connect place value models with their numerical equivalents to 1,000.</p> <p>2.2.C Add and subtract two-digit numbers efficiently and accurately using a procedure that works with all two-digit numbers and explain why the procedure works.</p> <p>3.1.C Fluently and accurately add and subtract whole numbers using the standard regrouping algorithms.</p>	<p>Use the partial-sums algorithm to solve multi-digit addition problems. PE 3.1.C</p>	<p>Consider two days for this lesson if your students are not secure in addition with two-digit addends or estimation. When students make Ballpark Estimates be have multiple students share their estimates and more importantly their strategies. Students should understand there are many strategies for making estimates. (i.e. Ballpark, front-end, rounding, compatible numbers, etc.)</p>	<p>ballpark estimate, partial-sums method</p>	<p><i>P2 Target: 50:</i> SRB p312, MM p411&465 PE 2.2.C & 2.1.B</p>	<p>Possible 2-day Lesson</p>	<p>Solve multi-digit addition problems. PE 3.1.C</p>	<p>TLG p139, "Explain how you found the length of the fence in No. 6."</p>
2♦8	<p>1.1.G Group numbers into tens and ones in more than one way.</p> <p>2.2.C Add and subtract two-digit numbers efficiently and accurately using a procedure that works with all two-digit numbers and explain why the procedure works.</p> <p>3.1.C Fluently and accurately add and subtract whole numbers using the standard regrouping algorithms.</p>	<p>Apply place-value concepts to the counting-up strategy. PE 3.1.C</p>	<p>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). This supports PE 2.2.C. Several different models are presented in the margin of TLG p143. Many students may benefit from a vertical number line to record the counting strategy.</p>		<p><i>P2 Number Grid Difference:</i> SRB p301, MM p21 PE 2.2.C; P3R <i>Base-10 Trading Game:</i> MM p411 PE 1.1.G▲</p>	<p>2- day lesson</p>	<p>Solve multi-digit subtraction problems. PE 3.1.C</p>	<p>TLG p145, "Explain how you figured out what the time would be in 30 minutes in No. 3."</p>
2♦9	<p>3.1.E Solve single- and multi-step word problems involving addition and subtraction of whole numbers and verify the solutions.</p> <p>3.5.A Determine whether two expressions are equal and use "=" to denote equality.</p> <p>3.6.F Represent a problem situation using words, numbers, pictures, physical objects, or symbols.</p>	<p>Use parts-and-total diagram to interpret word problems and write an equation with 3 or more addends. PE 3.1.E & 3.6.F▼</p>	<p>Take time to review strategies for adding so students have multiple strategies for adding three or more numbers in any order (doubles, doubles + 1, fast tens, turn-arounds). Caution: This is the last formal instruction on addition and subtraction algorithms. Provide additional practice during unit 3 for students that have not mastered these algorithms (sums less than or equal to ten thousand and number of addends will be five or fewer). This will provide for a smoother transition to multiplication and division in unit 4.</p>	<p>addend</p>	<p><i>P2 Name That Number:</i> SRB p299, MM p451 PE 3.5.A</p>		<p>Write equivalent names for numbers. PE 3.5.A</p>	

Unit 3: Linear Measures and Area								
Overview: To explore the need for standard units of measure; to measure lengths using customary and metric units; to develop the concept of area; and to investigate the relationship between diameter and circumference.								
Big Ideas		Measurement & Geometry: Objects and shapes can be quantified, classified and described by their attributes and by using unit amounts. Estimation: A calculated guess can be made by using numbers that are close to actual numbers but easier to compute.						
Performance Expectations		Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes
3♦1	1.4.A Recognize that objects used to measure an attribute (length, weight, capacity) must be consistent in size.	Create a standard unit of measure for the class. PE 1.4.A	Touch & Go Part 1.	standard unit, length		Empty paper bag and a slip of paper for each child. One piece 15 ft long of adding machine tape. Part 3 (R) uses the book, "How Big is a Foot?" See 3♦4 & 3♦6 for straw prep. For 3♦9, collect empty cans or cylinders with labels. (See TLG p175 & 217)	Understand the need for Standard units of measure. PE 1.4.A	TLG p174, "Explain how you solved No.5."
3♦2	2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20. 2.3.C Measure length to the nearest whole unit in both metric and U.S. Customary units.	Measure to the nearest ¼ inch & ½ centimeter. PE 2.3.C▲	Touch & Go Part 1. Students need repeated practice measuring with a ruler to support fractional parts and measuring perimeter. Note: Home Link MM p66 will be needed later for use in 3♦4.	inch (in), line segment, centimeter (cm), millimeter (mm)	P2 Addition Top-It. SRB p270, MM p440 PE 2.2.A	Cut rulers from transparency of bottom of MM p65. May need to precut rulers on MM p413. Envelopes to store student cut rulers.	Measure line segments to the nearest ½ inch. PE 2.3.C▲	
3♦3	2.3.A Identify objects that represent or approximate standard units and use them to measure length. 2.3.B Estimate length using metric and U.S. customary units. 3.1.D Estimate sums and differences to approximate solutions to problems and determine reasonableness of answers. 4.4.B Solve single- and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.	Use personal references to estimate lengths in US customary units. PE 2.3.A & 2.3.B	Although converting units of length is a 4 th grade standard, this lesson is appropriate and provides a foundation for future learning. Focus on estimation.	U.S. customary system, metric system, foot, yard, personal references, milli-, centi-, meter, decimeter		2-day lesson. Label tape measures with the children's tool-kit numbers.	Make ballpark estimates and record number models. PE 3.1.D	
3♦4	2.3.C Measure length to the nearest whole unit in both metric and U.S. customary units. 3.4.D Measure and calculate perimeters of quadrilaterals.	Find perimeter of straw polygons by measuring and adding sides. PE 3.4.D	Use Home Link MM p66 to complete SMJ p64. Save SMJ p64 as it will be used again in unit 10 with a Supplemental Lesson.	Triangle, square, rhombus, rectangle, parallelogram, trapezoid, perimeter, polygon		Prepare 4, 6 & 8-inch straws, 6 ea per child & 18 twist-ties 18 per child. 3♦7 & 3♦8 require large squares of paper (1 yd on a side) and square foot paper (See TLG p193 & 206)	Measure to the nearest centimeter. PE 2.3.C	TLG p192, "Explain how you know which numbers are greater in No. 3."
3♦5	1.2.E Add three or more one-digit numbers using the commutative and associative properties of addition. 3.5.E Construct and analyze pictographs, frequency tables, line plots, and bar graphs.	Create and analyze line plots (Part 2). PE 3.5.E	Part 1 is Optional . Focus on Line Plots in Part 2. Home Link MM p69 is great for additional practice. Provide ample time to analyze the data.			Make double thick pattern blocks by taping 2 squares, 2 triangles & 2 trapezoids together. See TLG p194 for Enrichment preparation. Part 3 uses the book, "Probably Pistachio".	Use the associative property of addition for 3- and 4-addend problems. PE 1.2.E▲	

3♦6	<p>2.3.E Use both analog and digital clocks to tell time to the minute.</p> <p>3.4.D Measure and calculate perimeters of quadrilaterals.</p>	<p>Construct rectangles with given perimeters. PE 3.4.D</p>	<p>Focus on Exploration A. Consider running two stations. One playing games and doing math boxes, the other completing Exploration A with adult. Have students partner to share geoboards. Then switch groups. Do Exploration C if time permits. Exploration B is Optional.</p>	<p><i>Tiling</i></p>		<p>EXPLORATIONS Read <i>Teacher Reference Manual</i> for info on stations. If no geoboards, use MM p415. Use straws from Lesson 3♦4, 10 ea per group. See TLG p200.</p>	<p>Tell time to the nearest 5 minutes. PE 2.3.E</p>	<p>TLG p204, "Would you use a ruler or a yardstick to measure the height of the classroom door?"</p>
3♦7	<p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>4.3.B Determine the approximate area of a figure using square units.</p>	<p>Use arrays to find the area of rectangles. PE 4.3.B</p>	<p>Skip "Making Squares with 1-Foot Sides" and "Reviewing the Concept of Area" in Part 1. Focus on the connection between area and the concept of multiplication, which will be revisited in 4♦2. Do not teach a formula at this time. Home Link MM p72 is additional practice with arrays and areas of rectangles.</p>	<p>Area, square feet, square yards</p>	<p><i>P2 Subtraction Top-It</i>. SRB p310 PE 2.2.A</p>	<p>See TLG, p206 for the large paper directions mentioned above in 3♦4.</p>	<p>Demonstrate automaticity with basic facts. PE 2.2.A</p>	<p>TLG p210, "Explain what <i>area</i> means in No. 2."</p>
3♦8	<p>4.3.B Determine the approximate area of a figure using square units.</p> <p>4.3.C Determine the perimeter and area of a rectangle using formulas, and explain why the formulas work.</p>	<p>Use arrays to write multiplication expressions (number models) to find the area of rectangles. PE 4.3.C</p>	<p>Skip Math Message and Follow Up, as well as "Using 1-Yard Squares to Estimate Area" in Part 1. Do all other Part 1 activities. To complete Part 2 "Simulating a Shopping Trip" utilize SRB p212-217.</p>			<p>Enough 1-yard squares to lay along the length of one classroom wall. Transparency of MM p417 or draw grid on board. Cylinders for 3♦9 (TLG p217 & 218).</p>	<p>Use strategies to calculate the area of rectangles. PE 4.3.B</p>	
3♦9	<p>2.4.A Solve problems involving properties of two- and three-dimensional figures.</p> <p>4.3.B Determine the approximate area of a figure using square units.</p>	<p>Identify the circumference and the diameter of circular objects. PE 2.4.A</p>	<p>Skip all of Part 1. Identifying the circumference of a circle is a 6th grade standard. Do Part 2, which reinforces two-rule frames and arrows. Then use SMJ p74 and have students find the perimeter of each of the rectangles.</p>	<p>Circumference, diameter, center, about 3 times circle rule</p>		<p>Variety of cans labeled A, B, C, etc. Other cylinders. (TLG p217) Tape together MM p77 & 78 to make cm sheets, 1 per partnership.</p>	<p>Calculate area of rectangles. PE 4.3.B</p>	

Unit 4: Multiplication and Division								
Overview: To model and solve multiplication number stories and practice multiplication facts; to model and solve division number stories and practice division facts; and to explore the links between multiplication and division.								
Big Ideas	Equivalence 1: Any number or equation can be represented in multiple ways. Number Relationships: Addition and subtraction are inverse operations of each other and multiplication and division are inverse operations of each other. Properties: Properties of operations and equality are rules based on relationships that are always true.							
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes
4♦1	<p>3.2.A Represent multiplication as repeated addition, arrays, counting by multiples, and equal jumps on the number line, and connect each representation to the related equation.</p> <p>3.2.F Solve and create word problems that match multiplication equations.</p> <p>3.2.H Solve single- and multi-step word problems involving multiplication and division and verify the solutions.</p> <p>3.6.F Represent a problem situation using words, numbers, pictures, physical objects or symbols.</p>	Use multiplication diagrams to model equal groups for multiplication. PE 3.2.A	SMJ p79, as well as the Enrichment Activity, are two of the few opportunities for students to create word problems with multiplication to support PE 3.2.F .	Multiplication/ division diagram, multiplication, multiples of equal groups		Gather multiple packages of school supplies. Post guide from MM p406. Display a multiplication / division diagram. Part 3 uses the book "Each Orange Had Eight Slices."	Use strategies to compute multiplication facts. PE 3.2.H & 3.6.F	TLG p246, "Draw a different polygon with the same perimeter as in No. 4. Explain how you know that the two polygons have equal perimeters."
4♦2	<p>3.2.A Represent multiplication as repeated addition, arrays, counting by multiples, equal jumps on the number line, and connect each representation to the related equation.</p> <p>3.2.D Apply and explain strategies to compute multiplication facts to 10 x 10 and the related division facts.</p>	Use arrays to model commutative property (turn-around rule) for multiplication. PE 3.2.A	Arrays are an important concrete model that students can use to represent multiplication that will provide a strong connection to the concept of area to support PE 3.2.D . Provide ample time for the Math Message Follow-Up to ensure students can identify all of the possible arrays for 24. If students need additional practice, use other numbers up to 36.	Array, factor, product		Large supply of pennies or counters. See details in Home Link 4♦2. Post guide and diagram from lesson 4♦1.	Using arrays and multiples of equal groups to demonstrate the meaning of multiplication. PE 3.2.A	TLG p252, "Why are estimates helpful in No. 3."
4♦3	<p>2.3.E Use both analog and digital clock to tell time to the minute.</p> <p>3.2.B Represent division as equal sharing, repeated subtraction, equal jumps on the number line, and formation of equal groups of objects, and connect each representation to the related equation.</p>	Use equal sharing and equal grouping to model division. PE 3.2.B	Readiness activity provides opportunity to develop vocabulary for division, as well as practice with a pictorial model for equal groups.		<i>P2 Division Arrays:</i> SRB p282, MM p418 PE 3.2.B	Prepare an Arrays exhibit. See TLG p254 for what to write. Part 3 uses the book, "The Doorbell Rang."	Tell time to nearest minute; write time in digital notation. PE 2.3.E	
4♦4	<p>3.2.B Represent division as equal sharing, repeated subtraction, equal jumps on the number line, and formation of equal groups of objects, and connect each representation to the related equation.</p> <p>3.2.C Determine products, quotients, and missing factors using the inverse relationship between multiplication and division.</p> <p>3.2.H Solve single and multi-step word problems involving multiplication and division and verify the solutions.</p>	Use multiplication/division diagram in number stories to reinforce the relationship between these operations. PE 3.2.C & 3.2.H	Number lines are important pictorial models that students can apply to many areas of mathematics. Model and practice this strategy often. Use the Readiness Activity "Making Equal Groups on a Number Line" to support representing division as equal jumps on the number line PE 3.2.B .	Quotient, dividend, divisor, remainder	<i>P2 Division Arrays:</i> SRB p282, MM p418 PE 3.2.B	Post guide and diagram from lesson 4♦1. Multiple copies of MM p419 for each child.	Use equal sharing to demonstrate the meaning of division. PE 3.2.B	
4♦5	<p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>3.2.A Represent multiplication as repeated addition, arrays, counting by multiples, equal jumps on the number line, and connect each representation to the related equation.</p> <p>3.2.D Apply and explain strategies to compute multiplication facts to 10x10 and the related division facts.</p> <p>3.2.E Quickly recall those multiplication facts for which one factor is 1, 2, 5, or 10 and the related division facts.</p> <p>4.3.B Determine the approximate area of a figure using square units.</p>	Use skip counting and the commutative, identity and zero properties of multiplication for automaticity with tables of 0s, 1s, 2s, 5s, & 10s facts. PE 3.2.D & 3.2.E	During Mental Math, model representing multiplication as equal jumps on the number line to support PE 3.2.A . Use the Readiness Activity "Building Facts on a Geoboard" and MM pg95 and 97 to have students draw arrays for facts and fact families concentrating on 0, 1, 2, 5, and 10 facts to support PE 3.2.E .	Factor, product, fact power, turn-around shortcut, square numbers	<i>P1 Beat the Calculator (Multiplication):</i> SRB p279, MM p446 PE 2.2.A		Find the area of rectangular shapes by counting unit squares. PE 4.3.B	

4♦6	<p>1.2.D Demonstrate the inverse relationship between addition and subtraction by undoing an addition problem with subtraction and vice versa.</p> <p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>3.2.A Represent multiplication as repeated addition, arrays, counting by multiples, and equal jumps on the number line, and connect each representation to the related equation.</p> <p>3.2.C Determine products, quotients, and missing factors using the inverse relationship between multiplication and division.</p>	<p>Use facts triangles and the facts table to generate multiplication and division fact families. PE 3.2.C</p>	<p>Modification: Use Supplemental Activity “Identifying the Facts to be Memorized” from Gr4 Lesson 3♦2: Multiplication Facts TLG p165 with Part 1. During Mental Math, encourage the use of number lines as one form of a diagram to support PE 3.2.A. NOTE: In order to achieve mastery of all facts by 4th grade, a grade appropriate goal is: 100% of 3rd grade students master their 1s, 2s, 5s, and 10s facts; 75% to master an additional two facts (i.e. 3s & 4s); 50% to master an additional four facts (i.e. add 6s & 9s); 25% to master all of the facts. Have students set individual fact fluency goals and revisit them often.</p>	<p>Multiplication/ division facts table</p>	<p><i>P2 Beat the Calculator</i> (Multiplication): SRB p279, MM p446 PE 2.2.A</p>	<p>Copies MM p101-102 to send with Home Link.</p>	<p>Using the +, - and = symbols. PE 1.2.D</p>	
4♦7	<p>3.2.A Represent multiplication as repeated addition, arrays, counting by multiples, and equal jumps on the number line, and connect each representation to the related equation.</p> <p>3.2.B Represent division as equal sharing, repeated subtraction, equal jumps on the number line, and formation of equal groups of objects, and connect each representation to the related equation.</p> <p>3.2.D Apply and explain strategies to compute multiplication facts to 10 X 10 and the related division facts.</p> <p>3.2.H Solve single- and multi-step word problems involving multiplication and division and verify the solutions.</p>	<p>Use the commutative, identity and zero properties of multiplication to develop automaticity with facts 1-6. PE 3.2.D</p>	<p>Use both the Readiness and Enrichment activities for additional practice to create arrays to support PE 3.2.A. Use Math Boxes #1 (PE 3.2.A) and #3 (PE 3.2.B) to assess student’s ability to create arrays and equal share.</p>		<p><i>P1 Baseball Multiplication</i>: SRB p274-7, MM p443-5 PE 3.2.D</p>	<p>Review Baseball Multiplication. MM p443, 1 ea per team & 1 transparency or make a poster. 4♦8 requires Fact Platters TLG p282 & 286.</p>	<p>Use equal sharing and equal grouping to demonstrate the meaning of division. PE 3.2.H</p>	<p>TLG p281, “For No.2, explain how you found the range.”</p>
4♦8	<p>3.2.A Represent multiplication as repeated addition, arrays, counting by multiples, equal jumps on the number line, and connect each representation to the related equation.</p> <p>3.2.E Quickly recall those multiplication facts for which one factor is 1, 2, 5, or 10 and the related division facts</p>	<p>Use real life array models to solve multiplication problems (Exploration B). PE 3.2.A</p>	<p>If your students struggled with arrays in the previous lesson, allow ample time for each of the explorations.</p>			<p>EXPLORATIONS Tape (or draw) fact platters to the board from Planning Ahead TLG p282 and see p 286. 4♦9 requires maps. 4♦9 (R) students bring toy animals.</p>	<p>Record multiplication facts. PE 3.2.E</p>	<p>TLG p286, “For No. 1, show how you found one of your answers. Explain your thinking.”</p>
4♦9	<p>2.3.C Measure length to the nearest whole unit in both metric and U.S. customary units.</p> <p>3.2.B Represent division as equal sharing, repeated subtraction, equal jumps on the number line, and formation of equal groups of objects, and connect each representation to the related equation</p> <p>3.3.A 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>4.1.G Mentally multiply two-digit numbers by numbers through 10 and by multiples of 10.</p>	<p>Use measurement and multiplication strategies to solve map-scale problems. PE 2.3.C.▲ & 4.1.G▼</p>		<p>Map scale, scale factor</p>	<p><i>P2 Division Arrays</i>: SRB p282, MM p418 PE 3.2.B</p>	<p>Display maps & US temp map from Planning Ahead TLG p287. MM p109, 1 per 6 students. Home Link MM p110-111 copied on separate sheets.</p>	<p>Order whole numbers and fractions on a number line. PE 3.3.A</p>	<p>TLG p293, “Explain how you figured out the number you wrote in the first empty frame of No. 6.”</p>
4♦10	<p>2.4.B Collect, organize, represent, and interpret data in bar graphs and picture graphs.</p> <p>4.4.A Represent an unknown quantity in simple expressions, equations, and inequalities using letters, boxes, and other symbols.</p>	<p>Determine fairness of an event after analyzing data from a probability experiment. PE 4.4.A</p>	<p>Although this is a 4th grade standard, this is a great opportunity to provide exposure to probability. Focus on collecting and organizing data.</p>	<p>Heads, tails, fair, equally likely</p>		<p>If you wish, gather carpet squares or blotters to reduce noise and bounce for coin toss.</p>	<p>Collect and organize data. PE 2.4.B▼</p>	

Unit 5: Place Value in Whole Numbers and Decimals								
Overview: To extend previous lessons on the base-10 place-value system to whole numbers through millions and to decimals through thousandths; to apply these concepts to reading, writing, comparing, and ordering whole numbers and decimals; and to use whole numbers and decimals in real-life contexts.								
Big Ideas								
Place Value: There is a predictable pattern in the Base-Ten numeration system. The value of the digits 0-9 is determined by their position.								
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes
5♦1	3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols. 3.2.D Apply and explain strategies to compute multiplication facts to 10 X 10 and the related division facts.	Read and write whole numbers in the 10,000s. PE 3.1.A▲	Before playing Baseball Multiplication, have students review their strategies for multiplying to support PE 3.2.D.	ones, tens, hundreds, thousands, ten-thousands.	P2 <i>Baseball Multiplication</i> . SRB p274-7, MM p443-5 PE 3.2.D	Prepare class Place-Value chart or use MM p422; Prepare labeled index cards for Readiness activity	Write whole numbers up to 5 digits. PE 3.1.A	
5♦2	3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols. 4.4.E Determine the median, mode, and range of a set of data and describe what each measure indicates about the data.	Develop strategies to compare whole numbers in the 10,000s. PE 3.1.A▲		maximum, median, > (greater than), < (less than).	P1 <i>Number Top-It</i> (5-Digit): SRB p302, MM p423-4 PE 3.1.A	Prepare Place-value mats, 1 per student, MM p423-424	Find the maximum, minimum and range of a data set. PE 4.4.E	
5♦3	3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols. 4.1.E Compare the values represented by digits in whole numbers using place value.	Find patterns in the base-10 system to read numbers in the millions. PE 4.1.E	Although the standard indicates place value to the ten thousands, it is appropriate for students to be exposed to numbers beyond that.	hundred-thousand, million	P1 <i>Number Top-It</i> (7-Digit): SRB p304, MM p423-4 PE 3.1.A▲	Add millions to class Place-Value chart or use MM p126, Place-Value mats are used again (see 5-1)	Compare numbers. PE 3.1.A▲	TLG p334, "Use the data set to find the maximum, minimum, and range in No. 3. Show your work."
5♦A	3.1.B Round whole numbers through 10,000 to the nearest ten, hundred, and thousand.	Use rounding strategies to compare numbers up to 10,000s. PE 3.1.B	Supplemental Lesson to support rounding whole numbers PE 3.1.B. Gr3 California Project #7: Rounding . Do all.					
5♦4	3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols. 3.1.B Round whole numbers through 10,000 to the nearest ten, hundred, and thousand. 4.1.E Compare the values represented by digits in whole numbers using place value.	Use rounding strategies to compare numbers in the 100,000s. PE 3.1.B▲ & 4.1.E	Skip Part 1 of 5♦4 & 5♦5. Students have just learned rounding and should be applying this to numbers that are more manageable. Provide additional opportunities for this every time the text asks student to work with ballpark estimates.	Population, census	P3EP <i>Number Top-It</i> (7-Digit): SRB p304, MM p423-4 PE 3.1.A▲	Readiness activity: Label 6 paper bowls; see TLG p336.	Compare very large numbers. PE 4.1.E	TLG p340, "Explain how you know which operation to use in No. 1."
5♦5	2.2.D Add and subtract two-digit numbers mentally and explain the strategies used. 3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols.	Compare and order very large whole numbers (7-Digit Number Top-it). PE 3.1.A▲		pie graph	P2 <i>Number Top-It</i> (7-Digit): SRB p304, MM p423-4 PE 3.1.A▲	Math Message: MM p134, 1 per 3 students, cut apart. For Lesson 5♦8, collect examples of decimal numbers. See TLG p346,	Use basic facts to compute extended facts. PE 2.2.D▲	TLG p345, "Solve No. 4 using another method. Show your work and explain what you did."
5♦6	2.1.B Connect place value models with their numerical equivalents to 1,000.	Describe how to count numbers in the 1,000s using base-ten blocks (Exploration A). PE 2.1.B▲	Hint: In Exploration C, in order to stabilize the hinge point while rolling the pattern block, have students place it standing up on its edge, rather than flat on the table. Model for your students prior to the exploration.	cube, long, flat, big cube		EXPLORATIONS One each of Base-10 blocks for Math Message. Part 3 (R) uses the book, "How Much is a Million?" Part 3 (R) MM p426-427, assembled.	Use place-value knowledge to count base-10 blocks. PE 2.1.B	TLG p350, "Can the money amounts in No. 2 be written without the zeros? Explain your thinking."

5♦7	<p>2.2.H Name each standard U.S. coin, write its value using the \$ sign and the ¢ sign, and name combinations of other coins with the same total value.</p> <p>4.2.A Represent decimals through hundredths with place value models, fraction equivalents, and the number line.</p>	Use base-10 blocks to relate decimals to money amounts where \$1 (one whole) is represented as a flat. PE 4.2.A	This lesson provides a strong conceptual framework for decimals, which is a fourth grade standard. The connection between money and place value, introduced in the math message, should be extended throughout the lesson. The flats are one dollar or hundreds, longs are dimes or tens, small cubes are pennies or ones.	tenths, hundredths		Math Message: MM p138, 1 per 3 students, cut apart. Part 2; create a class line plot with sticky notes (See TLG p355). Part 3 (R), MM p426-427 to create 10 x 10 grid.	Read and write money totals. PE 2.2.H▲		
5♦8	<p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>4.2.A Represent decimals through hundredths with place value models, fraction equivalents, and the number line</p> <p>4.4.B Solve single- and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.</p>	Use base-10 blocks to represent decimals. PE 4.2.A			P2 <i>Beat the Calculator</i> (Multiplication): SRB p279, MM p446 PE 2.2.A ; P3E <i>Base-10 Decimal Exchange</i> : MM p146 PE 4.2.A	Math Message: MM p141, 1 per 3 students, cut apart. Add to Decimal Number Museum. 5♦11, prepare P-Value Books, MM153-6 (TLG p 362)	Describe relationships between units of time. PE 4.4.B		
5♦9	<p>4.2.A Represent decimals through hundredths with place value models, fraction equivalents, and the number line</p> <p>4.2.B Read, write, compare, and order decimals through hundredths.</p>	Use base-10 blocks to relate decimals to metric units. PE 4.2.A				Create a 'meter-stick shelf', TLG p363 & 365.	Compare decimals. PE 4.2.B	TLG p366, "Explain why the area in No. 4 is measured in square units."	
5♦10	<p>4.2.B Read, write, compare, and order decimals through hundredths.</p> <p>4.2.D Convert a decimal to a fraction and vice versa and visually represent the number.</p>	Use fractional conversions of cm, mm & m to represent measurement as decimals. PE 4.2.D▲		precipitation, thousandths, millimeter	P2 <i>Number Top-It</i> (Decimals): SRB p305, MM p453-4 PE 4.2.B ; P3E <i>Decimal Solitaire</i> : MM p447 PE 4.2.B		Compare decimals. PE 4.2.B		
5♦11	<p>3.2.D Apply and explain strategies to compute multiplication facts to 10 X 10 and the related division facts.</p> <p>4.2.A Represent decimals through hundredths with place value models, fraction equivalents, and the number line</p> <p>4.2.B Read, write, compare, and order decimals through hundredths.</p>	Establish routines with a place value book to count decimals. PE 4.2.A & 4.2.B	<p>Skip all of Part 1 from lessons 5♦10, 5♦11, and 5♦12. Most of the material will be moved to 4th grade. Spend one day doing the following:</p> <p>5♦10 Do math boxes.</p> <p>5♦11. Play Baseball Multiplication and do math boxes.</p> <p>5♦12 Practice with x, ÷ Fact Triangles, and do math boxes.</p>		P2 <i>Baseball Multiplication</i> : SRB p274-7, MM p443-5 PE 3.2.D	MM p153-156, 1 per student plus a preassembled sample. (Place Value Books.)	Express values of digits in decimals. PE 4.2.B		
5♦12	<p>3.2.D Apply and explain strategies to compute multiplication facts to 10 X 10 and the related division facts.</p> <p>3.2.E Quickly recall those multiplication facts for which one factor is 1, 2, 5, or 10 and the related division facts.</p> <p>5.5.C Construct and interpret line graphs.</p>	Use collected length of the day data to plot a line graph (Project). PE 5.5.C			line graph		MM p159-160, 1 each for teacher.	Demonstrate automaticity with x2, x5, and x10 facts; use strategies to compute the remaining facts up to 10 x 10. PE 3.2.E & 3.2.D	TLG p382, "For No. 3, explain how you know which number in each pair is more."
5♦B	<p>3.5.E Construct and analyze pictographs, frequency tables, line plots, and bar graphs.</p>	Collect and organize data to construct and analyze pictographs. PE 3.5.E		<p>Supplemental Lesson to support analyzing and constructing pictographs PE 3.5.E.</p> <p>Gr3 Texas Project #9: Pictographs. Complete all.</p>			2-Day Lesson		

Unit 6: Geometry								
Overview: To investigate line segments, rays and lines; to explore polygons, including triangles and quadrangles; and to draw and measure angles.								
Big Ideas		Measurement & Geometry: Objects and shapes can be quantified, classified and described by their attributes and by using unit amounts. Transformations: Objects in space can be rotated (turned), translated (slid), reflected (flipped) and scaled in multiple ways.						
Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes	
6♦1 3.4.A Identify and sketch parallel, intersecting, and perpendicular lines and line segments 4.2.B Read, write, compare, and order decimals through hundredths.	Draw line segments. PE 3.4.A		line segment, endpoint, ray, arrowhead, line	P2 <i>Number Top-It</i> (Decimals): SRB p305, MM p453-4 PE 4.2.B	Prepare 5 straws and 6 twist-ties per student. For 6♦7, collect magazines with pictures. (See TLG p437)	Draw line segments. PE 3.4.A	TLG p406, "If the grid in No. 2 is ONE, how much more of the grid must be shaded to fill in the whole grid? Write a decimal and fraction. Explain how you figured it out."	
6♦2 3.4.A Identify and sketch parallel, intersecting, and perpendicular lines and line segments.	Draw parallel and intersecting lines. PE 3.4.A	Include perpendicular vocabulary in the lesson since it is not embedded in the lesson but is a third grade standard. See the 6♦3 Supplement on perpendicular lines.	parallel, intersect, perpendicular		Prepare 3 straws and 3 twist-ties per student. For geometry calisthenics, 3 lengths of rope or cord, each 12 – 20 feet long. (See TLG p408)	Identify parallel and intersecting lines and segments. PE 3.4.A	TLG p412, "Explain how using money to solve No. 1 might help someone understand which decimal is larger?"	
6♦3 3.4.A Identify and sketch parallel, intersecting, and perpendicular lines and line segments. 3.4.B Identify and sketch right angles 4.2.B Read, write, compare, and order decimals through hundredths. 4.3.B Determine the approximate area of a figure using square units.	Identify right angles (quarter turns) in different positions. PE 3.4.B	It is critical that you emphasize the vocabulary in this lesson to define and identify right angles and perpendicular lines. A Quarter turn in any direction makes a right angle or square corner. Use Supplement 6♦3: Perpendicular & Parallel Lines to connect to intersecting lines in lesson 6♦2.	clockwise, full turn, half-turn, quarter-turn, angle, vertex, side, counterclockwise, right angle, perpendicular	P2 <i>Number Top-It</i> (Decimals): SRB p305, MM p453-4 PE 4.2.B; P3E <i>Robot Game</i> PE 4.3.B	Prepare 4 straws and 1 twist-tie per student. Part 3 (E) draw an arrow for each player of Robot Game (TLG p419).	Read decimal numbers in the hundredths. PE 4.2.B		
6♦4 3.4.A Identify and sketch parallel, intersecting, and perpendicular lines and line segments. 5.3.C Identify, describe, and classify triangles by angle measure and number of congruent sides.	Establish attributes for equilateral and right triangles. PE 5.3.C		triangle, vertex, angle, equilateral triangle, right triangle		Prepare 6 each of - 4", 6" and 8" straws (18 total) and 18 twist-ties per student. One each – 3", 4" and 5" for teacher.	Draw line segments, rays, and lines. PE 3.4.A▲		
6♦5 3.4.C Identify and describe special types of quadrilaterals 3.5.A Determine whether two expressions are equal and use "=" to denote equality.	Compare attributes for quadrilaterals. PE 3.4.C	This activity is a great opportunity to focus on the concept that shapes may have more than one name, first explored in 2 nd grade lesson 5♦5. For example, a square is also a rectangle, a rhombus, a parallelogram, a quadrilateral, a polygon, etc. To support PE 3.4.C you may begin an extended discussion by defining a parallelogram and marking its 2 sets of parallel lines. Then look at the rhombus and rectangle as also having 2 sets of parallel lines and therefore can also be called parallelograms. They just have one added attribute (rhombi have 4 equal sides and rectangles have 4 right angles). This is the only lesson in 3 rd grade focused on quadrilaterals. EDM calls quadrilaterals "quadrangles", the standards use "quadrilaterals". Use vocabulary interchangeably so students are familiar with both terms.	quadrangle, quadrilateral , square, rhombus, parallelogram, rectangle, trapezoid, adjacent sides, kite	P2 <i>Name That Number</i> : SRB p299, MM p451 PE 3.5.A; P3R <i>Touch and Match Quadrangles</i> : MM p467 PE 3.4.C; P3E <i>Shading Shapes</i> : MM p457-8 PE 3.4.C	Two-Day Lesson Prepare 4 each of 2", 4", 6" and 8" straws (16 total) and 16 twist-ties per student. Part 3 (R) MM p467, 2 copies on cardstock, paper bag.	Identify points and draw lines segments to form a quadrangle. PE 3.4.C		

6↔6	<p>2.3.C Measure length to the nearest whole unit in both metric and U.S. customary units.</p> <p>2.4.A Solve problems involving properties of two- and three-dimensional figures.</p>	<p>Compare attributes for polygons and regular polygons. PE 2.4.A▲</p>		<p>polygon, plane, regular polygon</p>		<p>Prepare 6 each of – 2”, 4”, and 6” straws (18 total) and 18 twist-ties per student.</p>	<p>Measure line segments to the nearest ½ centimeter. PE 2.3.C▲</p>	
6↔7	<p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>4.1.A Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p>5.3.B Identify, sketch, and measure acute, right, and obtuse angles.</p>	<p>Describe angles as parts of a turn (rotation). PE 5.3.B▼</p>	<p>Although measuring angles is a 5th grade standard, the material in this lesson is very accessible for students.</p>	<p>rotation, vertical</p>	<p>P2 <i>Beat the Calculator</i> (Multiplication); SRB p279, MM p446 PE 2.2.A</p>	<p>Prepare N, S, E, W posters. Prepare 2 –2” straws & twist-tie per student. Connect 2 – 8” straws for demo.</p>	<p>Record known facts from Beat the Calculator. PE 4.1.A</p>	<p>TLG p442, “Look at the polygons in No. 5. Draw a different regular polygon and explain why it is regular.”</p>
6↔8	<p>3.4.B Identify and sketch right angles</p> <p>5.3.B Identify, sketch, and measure acute, right, and obtuse angles.</p>	<p>Recognize that angles (parts of a turn) have different measures (degrees). PE 5.3.B</p>	<p>Touch & Go. In 3rd grade, we want students to understand that you can describe angles by their measure in units of degrees and recognize basic measurements (i.e. quarter turn has a measure of 90°, a half-turn of 180°, and a full-turn of 360°).</p>	<p>degree</p>		<p>MM p428, 1 per 4 students plus extras.</p>	<p>Recognize a right angle. PE 3.4.B</p>	<p>TLG p448, “Explain how the shaded grids in No. 2 help you decide which decimal is smaller.”</p>
6↔9	<p>3.1.C Fluently and accurately add and subtract whole numbers using the standard regrouping algorithms.</p> <p>5.3.H Determine the number and location of lines of symmetry in triangles and quadrilaterals.</p>	<p>Use lines of symmetry to complete symmetrical shapes. PE 5.3.H▼</p>	<p>Optional: Part 1 & 2. Students have had plenty of experience with symmetry even though it is a 5th grade standard.</p>		<p>P2 <i>Angle Race</i>: SRB p271, MM p430&411 PE 3.1.C</p>	<p>Copy MM p441, 1 per 2 students, on cardstock and cut apart.</p>	<p>Complete symmetric shapes. PE 5.3.H▼</p>	
6↔10	<p>3.1.C Fluently and accurately add and subtract whole numbers using the standard regrouping algorithms.</p> <p>3.4.A Identify and sketch parallel, intersecting, and perpendicular lines and line segments.</p> <p>3.4.C Identify and describe special types of quadrilaterals.</p> <p>4.2.A Represent decimals through hundredths with place value models, fraction equivalents, and the number line.</p>	<p>Identify various types of lines and shapes from a design (Exploration B). PE 3.4.A, 3.4.C</p>	<p>Adjusting the Activity: Read TLG p458 ELL Activity and extend. In addition to identifying parallel and intersecting lines, ask students to identify perpendicular lines. Consider labeling additional points and ask students to identify different polygons. Also, how many quadrangles are in the design? How many triangles are in the design? When Math Boxes with 3-dimensional figures appear, talk through them as a teachable moment. Reinforce with students the difference between two and three-dimensional shapes. Exploration C is Optional.</p>		<p>P2 <i>Angle Race</i>: SRB p271, MM p430&411 PE 3.1.C</p>	<p>EXPLORATIONS Create examples for Home Link 6↔9 Follow-Up.</p>	<p>Model decimals with base-10 blocks and shaded grids; write the decimal represented by the base-10 blocks. PE 4.2.A</p>	<p>TLG p460, “Explain the difference between forty-hundredths and four-tenths in No. 4.”</p>
6↔11 & 6↔12	<p>4.1.A Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p>6.4.G Describe and sort polyhedra by their attributes: parallel faces, types of faces, number of faces, edges, and vertices.</p>	<p>Compare attributes and identify faces of pyramids and prisms. PE 6.4.G</p>	<p>Optional: Part1 & 2. Much of this could be just exposure but does not need to be mastered at this time.</p>			<p>Create a ‘<i>Solid Shapes Museum</i>’ from MM p194-5 and other shapes. See TLG p462.</p>	<p>Identify properties of solid figures. PE 6.4.G</p>	<p>TLG p466, “Explain how you figured out No.1. Draw a picture of what you did.”</p>
						<p>See Planning Ahead, TLG p473 directions for transferring information from SMJ1 to SMJ2.</p>	<p>Record known multiplication facts. PE 4.1.A</p>	

Unit 7: Multiplication and Division								
Overview: To review multiplication and division patterns; to extend basic multiplication facts; to practice making estimates of costs; and to explore ratios and geometric figures.								
Big Ideas		Equivalence 1: Any number or equation can be represented in multiple ways. Number Relationships: Addition and subtraction are inverse operations of each other and multiplication and division are inverse operations of each other. Patterns: Patterns repeat and can be extended in predictable ways.						
Performance Expectations		Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes
7♦1	<p>3.2.D Apply and explain strategies to compute multiplication facts to 10 X 10 and the related division facts.</p> <p>3.5.A Determine whether two expressions are equal and use "=" to denote equality.</p>	Use arrays to find patterns in Multiplication / Division table for products of square numbers. PE 3.2.D	Start with Readiness Activity "Building Square and Rectangular Arrays" to support PE 3.2.A .	product, factor, square numbers, square products	P2 <i>Name That Number</i> : SRB p299, MM p451 PE 3.5.A	Switching to SMJ #2: Have students copy data from SMJ p125 to p279 and from SMJ p64 to p251. Data on SMJ p43 is used in 7♦8. See options on TLG p581.	Compute multiplication facts. PE 3.2.D	
7♦2	<p>3.2.A Represent multiplication as repeated addition, arrays, counting by multiples, and equal jumps on the number line, and connect each representation to the related equation.</p> <p>3.2.D Apply and explain strategies to compute multiplication facts to 10 x 10 and the related division facts.</p>	Describe patterns in factors and products in terms of odd and even. PE 3.2.D				MM p431-434, Fact Triangles, copy on cardstock and send home with Home Link 7♦2.	Use arrays to model multiplication. PE 3.2.A	
7♦3	<p>4.1.A Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p>5.4.B Write a rule to describe the relationship between two sets of data that are linearly related.</p>	Use a game (<i>Multiplication Bingo</i>) to develop automaticity with multiplication facts. PE 4.1.A			P1 <i>Multiplication Bingo</i> : SRB p293, MM p449 PE 4.1.A		Find and use rules to solve multiplication and division problems. PE 5.4.B	TLG p591, "Look at No. 3: Explain how rays and lines are alike and how they are different."
7♦4	<p>3.5.A Determine whether two expressions are equal and use "=" to denote equality.</p> <p>5.4.C Write algebraic expressions that represent simple situations and evaluate the expressions, using substitution when variables are involved.</p>	Solve number sentences involving parentheses. PE 5.4.C	Touch & Go to simply to provide exposure.	parentheses	P3R <i>Name That Number</i> : SRB p299, MM p451 PE 3.5.A	Part 3 (R), prepare index cards; see TLG p594.	Recognize that parentheses affect the order of operations. PE 5.4.C	TLG p598, "Write your own polygon riddle similar to the one in No. 4."
7♦5	<p>3.2.E Quickly recall those multiplication facts for which one factor is 1, 2, 5, or 10 and the related division facts.</p> <p>3.5.A Determine whether two expressions are equal and use "=" to denote equality.</p> <p>5.4.C Write algebraic expressions that represent simple situations and evaluate the expressions, using substitution when variables are involved.</p>	Write equivalent expressions using parentheses. PE 3.5.A & 5.4.C	This is excellent practice for mastery of basic multiplication facts to support PE 3.2.E .			Prepare class 4-column chart to match SMJ p166.	Recognize that the operation inside the parentheses is carried out first. PE 5.4.C	
7♦6	<p>2.2.A Quickly recall basic addition facts and related subtraction facts for sums through 20.</p> <p>4.1.D Multiply by 10, 100, and 1,000.</p> <p>4.4.B Solve single- and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.</p>	Use multiples of 10 to solve extended multiplication / division facts. PE 4.1.D	This lesson builds the conceptual understanding of multiplying by multiples of ten. Continue to practice this skill. Applications will occur in unit 9.	Extended facts	P2 <i>Beat the Calculator</i> (Multiplication): SRB p279, MM p446 PE 2.2.A		Use relationships between units of time to solve number stories. PE 4.4.B	TLG p611, "Describe a pattern you see and write three more facts that follow the same pattern shown in No. 1."

7♦7	<p>3.1.B Round whole numbers through 10,000 to the nearest ten, hundred, and thousand.</p> <p>3.1.D Estimate sums and differences to approximate solutions to problems and determine reasonableness of answers.</p> <p>3.6.E Select and use one or more appropriate strategies to solve a problem.</p> <p>3.6.G Explain why a specific problem-solving strategy or procedure was used to determine a solution.</p>	<p>Share and justify estimation strategies (See Readiness Activity). PE 3.1.B, 3.1.D▲ & 3.6.E</p>	<p>Review the work previously taught in 5♦A on rounding to reinforce the strategies while estimating.</p>			<p>Possible 2-day Lesson</p>	<p>Explain how an estimate was obtained. PE 3.6.G</p>	<p>TLG p616, "Write each number sentence in No. 1. Find a different answer for each by moving the parentheses."</p>
7♦8	<p>3.2.D Apply and explain strategies to compute multiplication facts to 10 x 10 and the related division facts.</p> <p>4.1.D Multiply by 10, 100, and 1,000.</p>	<p>Use multiples of 10 to solve extended multiplication / division facts. PE 4.1.D</p>	<p>Use the 2♦6 Supplemental Document July 2008 Highs and Lows students to construct a line graph.</p>		<p>P3EP <i>Baseball Multiplication</i> (tens): SRB p274-7, MM p445 PE 3.2.D</p>	<p>Use SMJ p43 (Journal 1) or copies of completed MM p48 see TLG p618 & 620 (High / Low Temp charts).</p>	<p>Multiply 2-digit numbers by a 1-digit number. PE 4.1.D</p>	
7♦9	<p>2.2.D Add and subtract two-digit numbers mentally and explain the strategies used.</p> <p>3.2.H Solve single- and multi-step word problems involving multiplication and division and verify the solutions.</p> <p>3.6.A Determine the question(s) to be answered given a problem situation.</p> <p>6.4.G Describe and sort polyhedra by their attributes: parallel faces, types of faces, number of faces, edges, and vertices.</p>	<p>Solve multiplication/division problems based on a set ratio (Exploration B). PE 3.2.H</p>	<p>Optional: Exploration C. Focus on problem-solving instead, using Exploration B to support PE 3.6.A</p>		<p>P2 <i>Roll to 100</i>. SRB p307, MM p456 PE 2.2.D</p>	<p>EXPLORATIONS For Math Message draw a 3-leaf clover on poster or board. See TLG p629 for extensive planning ahead – colored blocks in a bag for Part 1 & Part 3.</p>	<p>Identify and describe solid figures. PE 6.4.G</p>	

Unit 8: Fractions								
Overview: To explore fractional and spatial relationships; to introduce the number line for fractions; to find equivalent fractions; to compare fractions using region models; to name quantities greater than 1 with fractions and mixed numbers; and to solve number stories involving fractions.								
Big Ideas		Equivalence 1: Any number or equation can be represented in multiple ways. Number 2: A fraction represents a comparison of a part to the whole (region, set, segment). Number 1: Every number has a point on the number line. Two numbers are equal when they share the same point on the number line.						
Performance Expectations		Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes
8♦1	3.3.A 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.	Use pennies to determine fractional parts of a set. PE 3.3.A		Equal, whole (the ONE), denominator, numerator			Identify and write fractions that name regions. PE 3.3.A	
8♦2	4.4.G Determine a simple probability from a context that includes a picture. 4.4.H Display the results of probability experiments and interpret the results.	Make predictions from the results of a random-draw experiment. PE 4.4.H		Random draw	<i>P2 The Block-Drawing Game:</i> SRB p280 PE 4.4.H	Set up Fraction Museum display. Prepare chart for Random Draw experiment; see TLG p654 & 656.	Apply basic probability terms to describe single events. PE 4.4.G	
8♦3	3.3.A 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, or points on a number line. 4.1.A Quickly recall multiplication facts through 10 X 10 and the related division facts. 5.4.C Write algebraic expressions that represent simple situations and evaluate the expressions, using substitution when variables are involved.	Use pattern blocks to determine fractional parts of shapes (Exploration A). PE 3.3.A			<i>P2 Multiplication Bingo:</i> SRB p293, MM p449 PE 4.1.A	EXPLORATIONS Part 3, (E) uses the book "Grandfather Tang". Copy MM p435 on cardstock to make Tangrams - 1 for every 2 students.	Understand that parentheses affect the order of operations. PE 5.4.C	TLG p663, "In No. 2 how does knowing that 5 X 9 = 45 help you know that 5 X 900 = 4,500?"
8♦4	3.1.A Read, write, compare, order, and represent numbers to 10,000 using numbers, words, and symbols. 3.3.A 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.	Use folding strategy with paper strips to find and label fractions on number lines. PE 3.3.A				Students cut apart fraction strips from MM p247 for Math Message. Make 2 copies per student if doing part 3 (E)	Identify the value of digits in numbers through hundred-thousands. PE 3.1.A▲	TLG p669, "Explain your answer to No. 5."
8♦5	3.3.B Compare and order fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12. 3.3.C Represent and identify equivalent fractions with denominators of 2, 3, 4, 5, 6, 8, 9, 10 and 12. 4.4.H Display the results of probability experiments and interpret the results.	Use fraction cards to compare equivalent fractions from region and number line models. PE 3.3.B & 3.3.C		Unit fraction, equivalent fractions	<i>P1 Equivalent Fractions Game:</i> SRB p283 PE 3.3.C ; <i>P2 The Block-Drawing Game:</i> SRB p280 PE 4.4.H	Students will cut apart Fraction Cards in back of SMJ. Provide envelopes or ziplocks. HINT: To reduce number of cuts, have students cut between the black lines.	Make and test predictions for simple experiments. PE 4.4.H	
8♦6	3.3.B Compare and order fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12. 3.3.C Represent and identify equivalent fractions with denominators of 2, 3, 4, 5, 6, 8, 9, 10 and 12. 4.4.B Solve single- and multi-step problems involving familiar unit conversions, including time, within either the U.S. customary or metric system.	Use the relationship between numerator and denominator to compare fractions to ½. PE 3.3.B	At this point in the unit assess if students have mastered concepts presented in 8♦1 to 8♦5 before moving on to comparisons of fractions. Provide additional practice if necessary before moving on to 8♦6 comparison of fractions.		<i>P1 Fraction Top-It:</i> SRB p287 PE 3.3.B ; <i>P2 Equivalent Fractions Game:</i> SRB p283 PE 3.3.C	For Part 3, (E), label 3 sheets of paper with the following: 0, ½ and 1.	Describe relationships between equivalent units of time. PE 4.4.B	

8↗7	<p>3.3.B Compare and order fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.</p> <p>3.3.C Represent and identify equivalent fractions with denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.</p> <p>4.2.E Compare and order decimals and fractions (including mixed numbers) on the number line, in lists, and with the symbols $<$, $>$, or $=$.</p>	<p>Use region models to determine that mixed numbers make fractions with numerators greater than the denominators. PE 4.2.E▼</p>	<p>This is an important lesson that builds a conceptual foundation for mixed numbers.</p>	<p>Mixed Number</p>	<p><i>P2 Equivalent Fractions Game.</i> SRB p283 PE 3.3.C; P3EP <i>Fraction Top-It</i>: SRB p287 PE 3.3.B</p>	<p>MM p436, 1 per 3 students, cut apart.</p>	<p>Use Fraction Cards to find equivalent fractions. PE 3.3.B & 3.3.C</p>	<p>TLG p686, "In No. 5, what does <i>share equally</i> mean?"</p>
8↔8	<p>3.3.A 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>3.3.D Solve single and multi -step word problems involving comparison of fractions and verify the solutions</p>	<p>Share and justify strategies to solve number stories involving fractions. PE 3.3.D</p>	<p>Although there are many great word problems in this lesson, most of the word problems do not address comparison of fractions PE 3.3.D. Use Supplement 8↔8: Fraction Stories over the next few days have practice with these kinds of problems.</p>			<p>Prepare class line plot; see TLG p692. Part 3 (E) uses the book "Math Curse".</p>	<p>Solve problems involving fractional parts of a collection. PE 3.3.A</p>	<p>TLG p693, "In No. 4, is $\frac{4}{5}$ more or less than $\frac{1}{2}$? How do you know?"</p>

Unit 9: Multiplication and Division								
Overview: To multiply and divide with multiples of 10, 100, and 1,000; to use mental math to multiply; to share money; and to find products of 2-digit numbers.								
Big Ideas Place Value: There is a predictable pattern in the Base-Ten numeration system. The value of the digits 0-9 is determined by their position. Number Relationships: Addition and subtraction are inverse operations of each other and multiplication and division are inverse operations of each other.								
	Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes
9↔1	<p>2.2.C Add and subtract two-digit numbers efficiently and accurately using a procedure that works with all two-digit numbers and explain why the procedure works.</p> <p>3.2.F Solve and create word problems that match multiplication or division equations.</p> <p>3.6.A Determine the question(s) to be answered given a problem situation.</p> <p>4.1.G Mentally multiply two-digit numbers by numbers through 10 and by multiples of 10.</p>	<p>Use the Guide to Solving Number Stories to solve problems involving multiples of 10, 100 and 1,000. PE 3.2.F▲ , 3.6.A & 4.1.G▼</p>	<p>If your students struggled with any of the Mental Math and Reflexes problems, use the Readiness Activity "Extending Multiplication Fact Patterns" MM p268. See notes in lesson 7↔6.</p>		<p>P2 <i>Name That Number</i>. SRB p299, MM p451 PE 2.2.C</p>	<p>Post the 'Guide to Solving Number Stories' poster, MM p406. See TLG p 717 for continued work on sunrise / sunset and hi / low temperatures.</p>	<p>Solve problems involving multiples of 10, 100, and 1,000. PE 4.1.G▼</p>	<p>TLG p716, "Explain how you solved No. 4."</p>
9↔2	<p>3.2.F Solve and create word problems that match multiplication or division equations.</p> <p>3.2.G Multiply any number from 11-19 by a single digit number using the distributive property and place value concepts</p> <p>3.6.E Select and use one or more appropriate strategies to solve a problem.</p> <p>4.1.G Mentally multiply two-digit numbers by numbers through 10 and by multiples of 10.</p>	<p>Share and justify math strategies to multiply 1-digit by multi-digit numbers. PE 3.2.G▲ & 3.6.E▲</p>	<p>Modification: Keep Math Message and Follow-Up brief. Multiplication of 1-Digit Numbers by Multi-Digit Numbers should not be done mentally at this point. Instead, expand this lesson to address PE 3.2.G by providing conceptual understanding. Have students solve multiplication problems independently using their own invented strategies in more than one way. As students share, record their strategies on anchor charts. Connect student strategies to the distributive property and place value models (see Teachers Reference Manual Grades 4-6 p290-291 in your supplemental document for more information). Conclude with a discussion to identify similarities and differences between strategies.</p>			<p>2-day Lesson Prepare Multiplication / Division diagrams for class discussion in Part 1.</p>	<p>Use strategies to solve 1-digit by 2-digit multiplication problems. PE 4.1.G▼</p>	<p>TLG p722, "Explain how you figured out which numbers to write on the number line in No. 5."</p>
9↔3	<p>3.2.G Multiply any number from 11-19 by a single digit number using the distributive property and place value concepts</p> <p>3.3.B Compare and order fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.</p> <p>4.4.G Determine a simple probability from a context that includes a picture.</p>	<p>Use base-10 blocks to solve multiplication problems. (Supports partial-products algorithm - Exploration A). PE 3.2.G</p>	<p>Spend an entire day on "Modeling Multiplication with Base-10 Blocks" and Exploration A. Students must develop their concrete understanding of multiplication before moving on to more abstract models (i.e. partial products algorithm). Consider providing an extra copy of SMJ p211 with three different multiplication problems for students to have additional practice. Complete the remaining activities on day two.</p>		<p>P2 <i>Fraction Top-It</i>. SRB p287 PE 3.3.B</p>	<p>2-Day Lesson EXPLORATIONS Prepare an array grid for each group of students, MM p273-274.</p>	<p>Predict the outcome of an experiment. PE 4.4.G</p>	
9↔4	<p>3.2.G Multiply any number from 11-19 by a single digit number</p> <p>4.1.C Represent multiplication of a two-digit number by a two-digit number with place value models.</p> <p>4.1.F Fluently and accurately multiply up to a three-digit number by one- and two-digit numbers using the standard multiplication algorithm.</p>	<p>Use array grids to develop the partial-products algorithm. PE 4.1.C & 4.1.F</p>	<p>In order to support 4th grade students in mastering multiplication of three-digit by two-digit numbers, 3rd grade students should work towards mastery of up to three-digit by 1-digit multiplication.</p>	<p>Algorithm, partial-products algorithm</p>			<p>Use strategies to solve multiplication problems. PE 3.2.G▲ & 4.1.C</p>	
9↔5	<p>3.3.B Compare and order fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.</p> <p>4.1.F Fluently and accurately multiply up to a three-digit number by one- and two-digit numbers using the standard multiplication algorithm.</p> <p>4.1.H Estimate products to approximate solutions to problems and determine reasonableness of answers.</p>	<p>Use ballpark estimates with partial-products algorithm to solve problems involving money. PE 4.1.F & 4.1.H</p>	<p>Skip ALL of Part 1 and Home Link. Play <i>Fraction Top-It</i> and complete math boxes, except #3 (skip) anytime during the unit.</p>		<p>P2 <i>Fraction Top-It</i>. SRB p287 PE 3.3.B</p>	<p>If needed, prepare play money, MM p399-400 or use commercial dollars.</p>	<p>Compare fractions. PE 3.3.B</p>	

9♦6	<p>3.2.A Represent multiplication as repeated addition, arrays, counting by multiples, and equal jumps on the number line, and connect each representation to the related equation.</p> <p>3.3.A 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>4.1.A Quickly recall multiplication facts through 10 X 10 and the related division facts.</p> <p>4.1.B Identify factors and multiples of a number.</p>	Use even distributions of counters to determine factors of numbers. PE 4.1.B▼		Factors	<p>P1 <i>Factor Bingo</i>. SRB p285, MM p448 PE 4.1.B; P3R <i>Array Bingo</i>. SRB p273, MM p442 PE 3.2.A; P3E <i>Finding Factors</i>. MM p287 PE 4.1.A</p>	For each pair of students: six \$100 bills, forty \$10 bills, forty-eight \$1 bills. MM p399-402.	Use concrete materials to model common fractions. PE 3.3.A	TLG p746, "Explain how you decided if the game in No. 5 was fair."
9♦7	<p>3.2.B Represent division as equal sharing, repeated subtraction, equal jumps on the number line, and formation of equal groups of objects, and connect each representation to the related equation.</p> <p>3.3.A 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>4.1.B Identify factors and multiples of a number.</p> <p>4.2.A Represent decimals through hundredths with place value models, fraction equivalents, and the number line.</p>	Use equal sharing of money to solve division problems. PE 3.2.B▲			<p>P2 <i>Factor Bingo</i>. SRB p285, MM p448 PE 4.1.B; P3 <i>Money Trading Game</i>, MM p146 PE 4.2.A</p>		Solve problems involving fractional parts of a region. PE 3.3.A	TLG p752, "Explain how you could equally share the pizza leftover in No. 5 among 4 people."
9♦8	<p>2.2.D Add and subtract two-digit numbers mentally and explain the strategies used.</p> <p>3.2.C Determine products, quotients, and missing factors using the inverse relationship between multiplication and division.</p> <p>5.4.C Write algebraic expressions that represent simple situations and evaluate the expressions, using substitution when variables are involved.</p>	Share and justify strategies to solve division problems without dividing. PE 3.2.C			<p>P2 <i>Roll to 100</i>. SRB p307, MM p456 PE 2.2.D</p>		Understand that parentheses affect the order of operations. PE 5.4.C	
9♦9	<p>2.4.A Solve problems involving properties of two- and three-dimensional figures.</p> <p>4.1.B Identify factors and multiples of a number.</p> <p>4.1.F Fluently and accurately multiply up to a three-digit number by one- and two-digit numbers using the standard multiplication algorithm.</p>	Use diagonal grid organizer (lattice) to solve multiplication problems. PE 4.1.F	Skip all of Part 1. Teach Part 2 with the next lesson 9♦10. The Lattice multiplication algorithm is not transparent for students that struggle with place value. It is not appropriate to teach this method until students have a solid conceptual understanding of multi-digit multiplication. Therefore, it should not be introduced until the end of 4 th grade. Caution: this will affect a number of math boxes and assessments. As you come to these problems, rather than skipping them, have students complete using any other strategies.	Lattice multiplication	<p>P2 <i>Factor Bingo</i>. SRB p285, MM p448 PE 4.1.B</p>	Lesson 9♦10, Exploration F uses a variety of objects of different weights (paper clips, rubber bands, straws, pencils, crayons, erasers, etc.)	Identify and describe polygons. PE 2.4.A▲	TLG p764, "Explain how you found all the factors for 24 in No. 1."
9♦10	<p>4.1.C Represent multiplication of a two-digit number by a two-digit number with place value models.</p> <p>5.3.B Identify, sketch, and measure acute, right, and obtuse angles.</p>	Use base-10 array grids to solve multiplication problems (Exploration D). PE 4.1.C	Skip Explorations E and F. Do Math Message Follow-Up and Exploration D, and all Part 2 activities from this lesson and lesson 9♦9.	Equilateral triangle		EXPLORATIONS	Describe angle rotations. PE 5.3.B▼	

9♦11 & 9♦12	<p>3.2.D Apply and explain strategies to compute multiplication facts to 10 X 10 and the related division facts.</p> <p>3.4.C Identify and describe special types of quadrilaterals.</p> <p>4.1.C Represent multiplication of a two-digit number by a two-digit number with place value models.</p> <p>4.1.F Fluently and accurately multiply up to a three-digit number by one- and two-digit numbers using the standard multiplication algorithm.</p> <p>5.3.B Identify, sketch, and measure acute, right, and obtuse angles.</p>	<p>Use partial-products algorithm to solve 2-digit by 2-digit multiplication problems. PE 4.1.C & 4.1.F</p>	<p>Optional: Lessons 9♦11 and 9♦12. Math Box 9♦11 is good review of many grade level standards and paired with Math Box 9♦13. Have students complete both on different days. Caution: this will affect a number of problems with two-digit by two-digit multiplication. As you come to these problems, if additional practice is needed give students more appropriate problems such as single digit X 2-digit or skip.</p>		<p>P2 <i>Angle Race</i>: SRB p271, MM p430&411 PE 3.4.C</p>	<p>Part 2, <i>Angle Race</i>, use the 24-pin circle side of the geoboards. For Part 3 (E), MM p305, 1 per 2 students.</p>	<p>Describe angle rotations. PE 5.3.B▼</p>	<p>TLG p782, "Explain how you decided which bills Darius could give the cashier in No. 4."</p>
						<p>Use mental strategies to compute multiplication facts. PE 3.2.D</p>		
9♦13	<p>3.5.A Determine whether two expressions are equal and use "=" to denote equality.</p> <p>4.3.B Determine the approximate area of a figure using square units.</p> <p>7.1.B Represent addition, subtraction, multiplication, and division of positive and negative integers visually and numerically.</p>	<p>Use a number-line (thermometer) to solve number stories involving negative numbers. PE 7.1.B▼</p>	<p>Skip all of lesson. Math Box 9♦13 is good review of many grade level standards and paired with Math Box 9♦11. Have students complete both on different days.</p>	<p>Fahrenheit scale, degrees Fahrenheit, Celsius scale, degrees Celsius</p>	<p>P2 <i>Name That Number</i>: SRB p299, MM p451 PE 3.5.A</p>	<p>For Lesson 10.1, see <i>Planning Ahead</i>, TLG p789 for collection and labeling objects.</p>	<p>Find the areas of rectangular shapes. PE 4.3.B</p>	

Unit 10: Measurement and Data								
Overview: To review units, tools, and measures of weight, length, and capacity; to introduce the mean of a set of a data; and to gain experience with plotting points on a coordinate grid.								
Big Ideas		Measurement & Geometry: Objects and shapes can be quantified, classified and described by their attributes and by using unit amounts. Data: 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
10♦1	2.3.C Measure length to the nearest whole unit in both metric and U.S. customary units.	Use a ruler to measure line segments to the nearest ½ inch and ½ centimeter. PE 2.3.C▲				For Part 1, display 4 objects (See Planning Ahead TLG p789.) Part 3 (E), draw 12 in. and 100 cm line segments on chart or board. For 10♦3 & 4, collect different weight scales (see TLG p813). Lesson 10♦3 (R) requires 1 lb. package of pasta.	Measure to the nearest ½ inch. PE 2.3.C	
10♦2	3.3.B Compare and order fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12. 4.2.B Read, write, compare, and order decimals through hundredths. 6.4.E Determine the surface area and volume of rectangular prisms using appropriate formulas and explain why the formulas work.	Define volume by filling in boxes with cm cubes. PE 6.4.E▼	Volume is a sixth grade standard. Part 1 and Home link are Optional .	Height of a prism, volume, cubic centimeters, square centimeters, square inches	P2 <i>Fraction Top-It</i> . SRB p287 PE 3.3.B	Math Message uses cm cubes. Continue ordering of 4 objects in 10♦1. Gather materials for Lessons 10♦4, 10♦5, 10♦6	Write decimal numbers and identify the value of the digits. PE 4.2.B	
10♦3	3.2.D Apply and explain strategies to compute multiplication facts to 10 x 10 and the related division facts. 3.5.C Estimate, measure, and compare weight and mass using US customary and metric units. 4.1.B Identify factors and multiples of a number.	Use a scale to weigh objects. PE 3.5.C	Provide ample time for this lesson. Start with Readiness Activity "Comparing Weights".	Weight, capacity of a scale, precision	P2 <i>Factor Bingo</i> . SRB p285, MM p448 PE 4.1.B	Possible Two-Day Lesson Make 1 set of the 4 boxes from Home Link 10♦2 for discussion. Provide scales to weigh objects from 10♦1. Before lesson, students complete SMJ p241.	Use strategies to compute multiplication facts to 10 x 10. PE 3.2.D	TLG p823; "Write 3 more questions about the shape in No. 3. Then write the answers to your questions."
10♦4	3.2.C Determine products, quotients, and missing factors using the inverse relationship between multiplication and division. 3.5.C Estimate, measure, and compare weight and mass using US customary and metric	Use a variety of scales to weigh classroom objects (Exploration C). PE 3.5.C	Combine lessons 10♦4 and 10♦5. Modify as follows: Do Math Message and Follow Up from 10♦5 Readiness Activity "Comparing Capacities in Nonstandard Units TLG p834 from 10♦5 becomes Exploration A "Matching Items with Appropriate Units of Measure TLG p833 becomes Exploration B. Do Exploration C "Weighing Objects on Scales" from 10♦4. Complete as many parts as possible from Part 2 of both lessons.			EXPLORATIONS Math Message discussion uses 45 cubes and 3 longs. For Exploration C, provide scales. For Lesson 10♦5, collect labels with content and nutrition info, gather containers, Part 3 (E) uses ½ cup popped corn. (R) uses rice. See TLG p829.	Use mental strategies to compute multiplication facts. PE 3.2.C	TLG p828, "Draw a picture of the pizza in No. 3. Label the amount of pizza that each child ate. Show the amount left over. How much of the pizza did the 3 children eat altogether?"
10♦5	3.5.C Estimate, measure, and compare weight and mass using appropriate-sized US customary and metric units (minimal) 4.4.E Determine the median, mode, and range of a set of data and describe what each measure indicates about the data.	Determine appropriate units of measure for items. PE 3.5.C		capacity of a container		Set up capacity demo for Part 1.	Draw conclusions about data representations. PE 4.4.E	TLG p833, "Explain how you figured out which fractions were less than 2/3 in No. 4."

10♦6	<p>3.3.C Represent and identify equivalent fractions with denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.</p> <p>3.5.E Construct and analyze pictographs, frequency tables, line plots and bar graphs</p> <p>4.1.A Quickly recall multiplication facts through 10 X 10 and the related division facts.</p>	Graph a data set and determine the median. PE 4.4.E & 5.5.B▼	Mean is a 5 th grade standard. Touch & Go. This lesson should be for exposure.	Mean, average, median	P2 <i>Equivalent Fractions</i> Game: SRB p283 PE 3.3.C		Complete a bar graph. PE 3.5.E	
10♦7	<p>4.4.E Determine the median, mode, and range of a set of data and describe what each measure indicates about the data.</p> <p>5.5.B Determine and interpret the mean of a small data set of whole numbers.</p>		Skip all of Part 1. Begin with the Readiness Activity. Do all of Part 2 activities.	Median, mean, average	P2 <i>Multiplication Top-It</i> : SRB p297 PE 4.1.A	Before Lesson, students complete SMJ p251, 10♦5 Body Measures. Provide sticky notes for data collection. Before 10♦8, practice with calculator memory keys.	Explain the meaning of median. PE 4.4.E	
10♦8	<p>2.2.D Add and subtract two-digit numbers mentally and explain the strategies used.</p> <p>4.4.G Determine a simple probability from a context that includes a picture.</p>	Use mental strategies to add several 1-digit numbers (<i>Memory Addition/Subtraction</i>). PE 2.2.D		Memory, memory keys	P1 <i>Memory Addition/Subtraction</i> : SRB p290 PE 2.2.D	Math Message uses MM p347. Lesson 10♦10 uses a map. See TLG p851 for description.	Predict the outcome of an experiment. PE 4.4.G▲	TLG p850, "Find the perimeter of the shape in No. 1. Show your work and explain what you did."
10♦9	<p>3.3.A 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>3.5.E Construct and analyze pictographs, frequency tables, line plots and bar graphs</p> <p>4.4.E Determine the median, mode, and range of a set of data and describe what each measure indicates about the data.</p>	Determine the median and mode of a data set from a frequency table. PE 3.5.E & 4.4.E	Skip all of lesson. These concepts will be better addressed in the supplement that follows.	Frequency table, mode		For Part 1, prepare class chart. See TLG p852. For Part 3 (R), write one 2-digit number on index card per student - include some duplicates. Label 2 sheets of paper with <i>smallest</i> and <i>largest</i> .	Solve problems involving fractional parts of sets. PE 3.3.A	TLG p856, "Explain how you found the mean weight of newborn babies in No. 5."
10♦A	<p>3.5.E Construct and analyze pictographs, frequency tables, line plots, and bar graphs.</p>		Supplemental Lesson to support statistics PE 3.5.E. Gr2 Lesson 7♦8: Frequency Distributions . Use the arm span data from lesson 3♦4 SMJ p64 (Gr3). Extend, to have students construct a line plot individually or with partners for one additional measurement that you choose from lesson 3♦4.					
10♦10	<p>2.2.D Add and subtract two-digit numbers mentally and explain the strategies used.</p> <p>4.4.D Graph and identify points in the first quadrant of a coordinate plane using ordered pairs.</p> <p>4.4.E Determine the median, mode, and range of a set of data and describe what each measure indicates about the data.</p>	Use ordered pairs to locate points on a coordinate grid. PE 4.4.D		Coordinate grid, coordinate, plotting the point, ordered pair	P2 <i>Memory Addition/Subtraction</i> : SRB p290 PE 2.2.D	For Part 1, post the map. Draw a coordinate grid. (See TLG p858.)	Find the median of a data set. PE 4.4.E	

Unit 11: Probability; Year Long Projects Revisited								
Overview: To organize, graph, and interpret data; to represent the likelihood of outcomes with visual models; and to predict outcomes and estimate the make-up of a population using survey data and objects.								
Big Ideas		Data: Data can be collected, classified, analyzed & displayed using tables, charts & graphs. Chance: Collecting data on the occurrence of an event can help to determine its likelihood which can then be used to make predictions about the event.						
Performance Expectations	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing Reasoning Prompt- Math Boxes	
11♦1 3.2.D Apply and explain strategies to compute multiplication facts to 10 X 10 and the related division facts. 3.2.E Quickly recall those multiplication facts for which one factor is 1, 2, 5, or 10 and the related division facts. 4.4.C Estimate and determine elapsed time using a calendar, a digital clock, and an analog clock.	Determine elapsed time using data from the Sunrise-Sunset chart. PE 4.4.C	Skip all of Part 1. Begin with the Readiness Activity. Do all of Part 2 activities including Home-Link.	Winter solstice, summer solstice, autumnal equinox, vernal equinox			Recall multiplication facts. PE 3.2.D & 3.2.E	TLG p882, "Explain the estimation strategy you used in No. 6. Then find the exact answer to the problem. Show your work."	
11♦2 2.2.D Add and subtract two-digit numbers mentally and explain the strategies used. 2.3.E Estimate sums and differences. 3.1.C Fluently and accurately add and subtract whole numbers.	Determine range of temperatures using the National High/Low Temperatures chart. PE 3.1.C	Adjust the lesson as needed, as we used data for only one month, July 2008, rather than the entire year.		P2 <i>Memory Addition/Subtraction</i> . SRB p290 PE 2.2.D	Prepare 1 copy per 2 students of completed MM p48, National High / Low Temperature Project. For Lesson 11♦5, you will need to know the number of teachers in your school and how many are left-handed.	Tell and write time to the nearest minute on an analog clock. PE 2.3.E		
11♦3 2.4.B Collect, organize, represent, and interpret data in bar graphs and picture graphs. 4.4.G Determine a simple probability from a context that includes a picture. 4.4.H Display the results of probability experiments and interpret the results.	Use spinners to collect and analyze data from probability experiments. PE 4.4.H			P3EP <i>Soccer Spin</i> . MM p459-61 PE 4.4.G▼	Mark paper clips for spinners. See TLG p888.	Collect and organize data. PE 2.4.B		
11♦4 3.3.A Represents fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10 and 12 4.4.F Describe and compare likelihood of events 4.4.G Determine a simple probability from a context that includes a picture. 4.4.H Display the results of probability experiments and interpret the results.	Use degree marks on a circle to divide spinners to match given descriptions. PE 3.3.A & 4.4.G			P2 <i>The Block-Drawing Game</i> : SRB p280 PE 4.4.H ; P3EP <i>Spinning to Win</i> : SRB p309, MM p464 PE 4.4.H & 4.4.G	Provide extra copies of SMJ using MM p371 for students who make errors.	Understand basic probability terms. PE 4.4.F	TLG p897, "Describe the steps you followed to find the median in No. 6."	
11♦5 3.5.E Construct and analyze pictographs, frequency tables, line plots and bar graphs	Analyze a sample of data from a survey to make predictions. PE 3.5.E				Make sure you have collected data before lesson. See TLG p899.	Draw conclusions based on data representations. PE 3.5.E	TLG p903, "Explain how you figured out how long Danielle skates in a week in No. 6."	