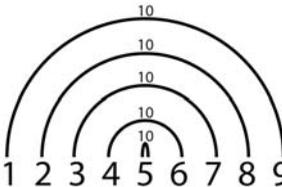**Unit 1:** Numbers and Routines

Overview: To review number patterns, number sequences, number grids, and number lines; to review months, weeks, and days, and telling time; to practice addition facts; to give equivalent names for numbers; and to compare numbers using the symbols <, >, and =

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 1:** Any number or equation can be represented in multiple ways. **Equivalence 2:** Numbers represent values that can be put together and taken apart.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Math Boxes
1♦1	**NS 1.1** Count, read, and write whole numbers to 1,000 and identify the place value for each digit. *NS 1.0 NS 1.3 SDAP 2.1*	Use a number line to sequence numbers to 1000.	**LIT** *A Day with No Math* by Marilyn Kaye *For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*	Math Message, number line	P3R *Number Line Squeeze*: MM p464 **NS 1.3**	Start collecting for your "Mathematics All Around" Bulletin Board. See TLG p18 for details. **Planning Ahead:** For 1♦2, prepare coins for student toolkits (4 Q, 10 D, 5N, 20P) Collect socks for slate activities (white boards).	Write and order numbers.	
1♦2	**NS 5.1** Solve problems using combinations of coins and bills. *NS 1.1*	Use a counting-up strategy to calculate the total value of coin combinations.	**LIT** *Arctic Fives Arrive* by Elinor J. Pinczes	slate, tool kit, Lost-and-Found Box, Pattern-Block Template		Prepare and label Toolkits. Provide 'Lost-and-Found' box for misplaced Toolkit items. See TLG p23. Part 3 (EP) uses the book. *Arctic Fives Arrive.*	Count coin combinations.	
1♦3	**MG 1.4** Tell time to the nearest quarter hour and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year). *NS 1.1 SDAP 2.1*	Use clocks to tell & show time to the nearest half-hour.	**Note:** The 2nd grade standard requires telling time to the quarter hour. The lessons in EDM go as far as to the nearest 5 minutes. Have an analog clock in your class (if you have a digital clock cover it up) and have students enter the date and time in their Math Journal every day. Build up the level of accuracy required as the year progresses until the standard is met.	calendar, ordinal numbers		Post name of the months in classroom.	Tell time to the nearest half-hour.	
1♦4	**NS 1.3** Order and compare whole numbers to 1,000 by using the symbols <, =, >. **NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *NS 1.0 MR 1.2*	Compare sums to 20 (*Addition Top-It*).			P1, 3R *Addition Top-It*: MRB p122, SMJ p5, MM p449 **NS 1.3 NS 2.2**; P3E *Coin Top-It*: MM p452-3 **NS 5.1 MR 1.2**	Post 'Working With a Partner' poster. Display Number-Grid Poster (yearlong). Copy MM p416 or p418 on cardstock and laminate or use sheet protectors for students to always have available.	Recall basic addition facts.	
1♦5	**NS 5.0** Students model and solve problems by representing, adding, and subtracting amounts of money. *NS 5.1 SDAP 2.1 MR 1.0*	Use bills to make exchanges on a place value mat.	This is a great opportunity to address place value. After completing SMJ p6, have students identify place value digits (i.e. "Which digit in $325 tells me how many ten dollar bills I have?")		P1, 2 *Money Exchange Game*: MRB p128, MM p448-461 **NS 5.1 MR 2.2**; P2 *Addition Top-It*: MM p449 **NS 1.3 NS 2.2**; P3R *Penny-Nickel Exchange Game*: MRB p128 **NS 5.1 MR 2.2**	Prepare money for toolkits. See TLG p38. Teaching Master of MM p458.	Count bill combinations.	

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 1

1♦6	**NS 1.0** Students understand the relationship between numbers, quantities, and place value in whole numbers up to 1,000. *NS 1.1 MR 1.1*	Find equivalences for 10- Complements of 10 (*Penny Plate*).		*My Reference Book*, Table of Content, Math Boxes	P2 *Penny Plate*: MRB p146-7, MM p46 **NS 1.2 MR 1.2**; P3R *Two-Fisted Penny Addition* (1st grade std.)	Part 2, *Penny-Plate* game requires containers such as paper or plastic plates.	Find missing addends.	
1♦A		Find equivalences for 10- Complements of 10.	**Supplemental Activities to support Fluency with complements of 10: 1 Day** Complements of 10 are extremely important for a variety of strategies and algorithms as well as for strength in number sense. Take an additional day for these activities to practice, reinforce and make sure students master this skill. You can use a diagram like the one shown here (Addition Rainbow for 10) as a reference guide for student having difficulties memorizing the pairs. A variation on the classic "Concentration" game where students find matches when cards add up to 10 (use cards 1-9) is also good practice. Consider a variation of a Top-It game where 2 students face each other each with their own deck of cards face down (cards 0-10). Students take turns flipping the top card of their deck and whoever calls out the correct complement the fastest gets to keep the card. For example, student A flips an 8; whoever says 2 the fastest keeps the card; then student B flips a card.					
1♦7	**SDAP 2.0** Students demonstrate an understanding of patterns and how patterns grow and describe them in general ways. *NS 1.1 MG 1.4 SDAP 2.2*	Use a number grid poster to find patterns in the base-10 number system.	**LIT** *Even Steven and Odd Todd* by Kathryn Cristaldi	number scroll, even number, odd number	P2 *Addition Top-It*: MRB p122-3, MM p449 **NS 1.3 NS 2.2**	Prepare poster for Group Work. **Classroom Management Tip:** See margin of TLG p48 for red cup / green cup group agreement system, when help from teacher is needed. Prepare adequate copies of MM p9 & p10 for number scrolls.	Complete & describe a number pattern.	TLG p49, "Explain your strategies for finding the missing numbers on the number grid in No. 2."
1♦8	**NS 1.0** Students understand the relationship between numbers, quantities, and place value in whole numbers up to 1,000. **SDAP 2.1** Recognize, describe, and extend patterns and determine a next term in linear patterns (e.g., 4, 8, 12 . . . ; the number of ears on one horse, two horses, three horses, four horses). *NS 1.1 SDAP 2.0 SDAP 2.2*	Use patterns in the base-10 number system to complete number grid puzzles.	**LIT** *One Hundred Hungry Ants* by Elinor J. Pinczes		P2 *Number Grid Game*: MRB p142-3, MM p418 **SDAP 2.2**	Part 3 R, MM p12, cut out and laminate or use cardstock.	Identify number grid-patterns.	
1♦9	**NS 1.2** Use words, models, and expanded forms (e.g., 45 = 4 tens + 5) to represent numbers (to 1,000). *NS 2.0 NS 2.2*	Use a calculator to show equivalent names for numbers.		equivalent name, program		Before lesson, practice with student calculators, especially the 'repeat' key. Part 3 R requires a pan balance and a collection of identical objects.	Find equivalent names for numbers.	
1♦10	**SDAP 2.2** Solve problems involving simple number patterns. *NS 1.1 SDAP 2.1*	Identify patterns when counting by different numbers.	**LIT** *12 Ways to Get to 11* by Eve Merriam			**Planning Ahead:** Before 1♦12, prepare Class Thermometer Poster with F˚. Unit 4 uses Poster with C˚ and F˚. See TLG p64 for assembly instructions.	Calculate the value of coin calculations.	TLG p63, "For No. 3, show 35¢ with the fewest number of coins. Explain how you know that you found the fewest number of coins."

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 2

1♦11	**NS 1.3** Order and compare whole numbers to 1,000 by using the symbols <, =, >. *NS 1.0 NS 5.1 MR 1.2 MR 2.1*	Use symbols to compare number values.	Have students who are struggling to remember the pictorial representation of each coin write the values above each one before adding. **LIT** *Math Counts Pattern* by Henry Pluckrose	is equal to, is less than, is greater than	P2 *Addition Top-It*: MRB p122-3, MM p449 **NS 1.3 NS 2.2**; P3E *Number Top-It* (5-digit numbers): MM p465-6 **NS 1.3**		Compare numbers in the tens and hundreds.	
1♦12	**NS 1.0** Students understand the relationship between numbers, quantities, and place value in whole numbers up to 1,000. *NS 1.2 NS 2.2 SDAP 2.1*	Count numbers in the 100s using base-10 blocks (Exploration B).	Measuring temperature with a thermometer is a third grade standard. First grade focused on measuring temperature at ten degrees intervals. Second grade will focus on measuring temperature to the nearest degree with positive numbers. This will support third graders to measure temperature with positive and negative numbers.	temperature, thermometer, Fahrenheit, Explorations, base-10 blocks, cube, long, flat	P2 *Addition Top-It*: MRB p122-3, MM p449 **NS 1.3 NS 2.2**	**EXPLORATIONS:** Plan for group work in Explorations. Consider creating a poster like the one on TLG p73. Cover Celsius side of Class Outdoor Thermometer with masking tape.	Identify even and odd numbers.	
CA Project 9	**MR 1.5** Determine the duration of intervals of time in hours (e.g., 11:00 a.m. to 4:00 p.m.). **SDAP 1.2** Represent the same data set in more than one way (e.g., bar graphs and charts with tallies). **(Can be done now or anytime after Unit 1)**	*A Day at the San Diego Zoo* Duration of time in hours and data representation.				TLG p 468A		

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 3

Unit 2: Addition and Subtraction Facts

Overview: To make up, represent, and solve addition and subtraction number stories; to review and apply alternative strategies for addition and subtraction; and to practice addition and subtraction facts for sums and differences up to and including ten.

Big Ideas	**Equivalence 2:** Numbers represent values that can be put together and taken apart. **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.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning– Math Boxes
2•1	**AF 1.2** Relate problem situations to number sentences involving addition and subtraction. *NS 2.2 AF 1.0*	Create, write equations (number models) for and solve addition number stories.	Model number stories multiple times for students. Have students write the word "equation" above the words "number model" on SMJ p21. **LIT** *Math For All Seasons* by Gregory Tang **LIT** *Mission: Addition* by Loreen Leedy *For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*	addition number story, label, unit box, number model, **equation**			Represent an "easy facts" number story using words, drawing, or tallies.	
2•2	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *AF 1.2*	Use properties of +0 and +1 facts to develop automaticity.		addition fact, +0 facts, +1 facts, +0 shortcut, +1 shortcut, fact power	P1 *Beat the Calculator*. MRB p124-5, SMJ p24; **NS 1.3 NS 2.2** P3R *Domino Top-It*. MRB p122-3 **NS 1.3 NS 2.2**	Prepare calculators for tool-kits. See margin p101 for poster of fact triangle roles – you might want one for your classroom.	Record addition facts.	
2•3	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *NS 2.0*	Use patterns in an addition facts table to develop automaticity with doubles facts.	**LIT** *Two of Everything: A Chinese Folktale* by Lily Toy Tong	doubles facts, sum, Facts Table, row, column, diagonal	P1, 2 *Doubles or Nothing*. SMJ p29, MM p456 **NS 2.2**	Prepare a large Facts Table from SMJ p27 and see TLG p105 for options. Prepare "Unit Box" on board and use accordingly.	Count back by 5s.	TLG p109, "How did you know what symbol to put in each in No. 4?"
2•4	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *AF 1.1 MR 2.1*	Use patterns in an addition facts table to develop automaticity with +9 facts.	Start with the Readiness activity which provides a concrete model and rationale of the +9 shortcut. Make sure students are familiar with this before memorizing the rule "down one and left one" shortcut on the number grid.	turn-around facts, +9 facts, +9 shortcut	P2 *Beat the Calculator*. MRB p124-5, SMJ p24 **NS 1.3 NS 2.2**	Prepare "Unit Box" on board and use accordingly	Solve +0 and +1 facts.	TLG p114, "Describe how you used your calculator to fin the answers for No. 1."
2•5	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *MR 2.1*	Develop strategies for addition that use doubles facts.		doubles-plus-1 facts, doubles-plus 2 facts	P2 *Domino Top-It*. MRB p122-3 **NS 1.3 NS 2.2**	Prepare "Unit Box" on board and use accordingly.	Record doubles facts.	
2•6	**NS 2.1** Understand and use the inverse relationship between addition and subtraction (e.g., an opposite number sentence for 8 + 6 = 14 is 14 - 6 = 8) to solve problems and check solutions. **AF 1.1** Use the commutative and associative rules to simplify mental calculations and to check results. *NS 2.2 MR 1.2*	Use dominoes to generate related addition and subtraction facts (Fact Families).		subtraction number story, -0 facts, -1 facts, -0 shortcut, -1 shortcut	P2 *Beat the Calculator*. MRB p124-5, SMJ p24; **NS 1.3 NS 2.2** P2 *Domino Top-It*. MRB p122-3 **NS 1.3 NS 2.2**	Before 2•7, have students prepare Fact Triangles from Activity Sheets 1 & 2 in SMJ. Provide zip bags for storage.	Recall & understand turn-around facts.	

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Flores, Canterbury, Fundanet, and Preston

Grade 2 Page 4

2•7	**NS 2.1** Understand and use the inverse relationship between addition and subtraction (e.g., an opposite number sentence for 8 + 6 = 14 is 14 - 6 = 8) to solve problems and check solutions. *NS 2.2 AF 1.1*	Use fact triangles to develop automaticity with related addition and subtractions facts (Fact Families).		fact triangle & fact family		Teaching Master of MM p423, Fact Triangle.	Write a number story to explain a number sentence.	TLG p129, "In No. 3, how does writing two addition facts help you write two subtraction facts?"
2•8	**NS 3.1** Use repeated addition, arrays, and counting by multiples to do multiplication. **MG 1.0** Students understand that measurement is accomplished by identifying a unit of measure, iterating (repeating) that unit, and comparing it to the item to be measured. **MR 1.2** Use tools, such as manipulatives or sketches, to model problems. *NS 2.2*	Use repeated addition strategies (i.e. doubles facts) to solve equal groups problems (Exploration C).	Although Exploration A addresses a 3rd grade standard it supports basic concepts of weight that are appropriate at this time. **Optional:** Exploration B, requires students to measure in units, which is a third grade standard. .	ounce, pound, pan balance, heavier, lighter, in balance (balanced), spring scale	P2 *Beat the Calculator*. MRB p124-5, SMJ p24 **NS 1.3 NS 2.2**	**EXPLORATIONS:** Exploration A: collect objects found in classroom between ½ ounce and 8 ounces such as student tape measure, 2-in binder clip, calculator, card deck, scissors, mug, pad of paper, small books, etc.	Count by 1s on a number grid.	TLG p136, "Describe any patterns you see in the number grid piece in No. 1."
2•9	**NS 1.2** Use words, models, and expanded forms (e.g., 45 = 4 tens + 5) to represent numbers (to 1,000). *NS 1.1 MR 1.2*	Generate addition or subtraction equivalencies for specific values (*Name That Number).*	Have students write one equation under their name-collection box using the target number and one of their examples to review. **LIT** *12 Ways to Get to 11* by Eve Merriam	name-collection box	P1 *Name That Number*. MRB p138, MM p462; **AF 1.3 NS 1.2 NS 2.2** P3R *Two-Fisted Penny Addition* (1st grade std.)	Prepare 'Unit Box" on board and use accordingly.	Write addition and subtraction number sentences; generate equivalent names for a given number.	
2•10	**SDAP 2.1** Recognize, describe, and extend patterns and determine a next term in linear patterns (e.g., 4, 8, 12 . . . ; the number of ears on one horse, two horses, three horses, four horses). *NS 2.2 SDAP 2.2*	Solve repeated addition or subtraction problems based on a rule (Frames-and-Arrows).	Frames and Arrows provide opportunities to work with patterns with both addition and subtraction. These activities are grade level appropriate and support the inverse relationship between these operations.	Frames-and-Arrows diagrams, frame, arrow, arrow rule	P2 *Name That Number*. MRB p138, MM p462 **AF 1.3 NS 1.2 NS 2.2**	Prepare 'Unit Box" on board and use accordingly. For Part 1, prepare Teaching Master of MM p43.	Extend a numeric pattern using addition and subtraction.	
2•11	**SDAP 2.1** Recognize, describe, and extend patterns and determine a next term in linear patterns (e.g., 4, 8, 12 . . . ; the number of ears on one horse, two horses, three horses, four horses). *NS 2.2 AF 1.2 SDAP 2.2*	Develop strategies to solve for missing numbers in function machine problems.	At this point it is important to have the students understand how the function machine really works, what the position of the missing number (i.e. the "rule", the "in" or the "out") really means and to develop strategies to solve for these. Plan to spend more time for discussion on strategies rather than solving them. A well-based strategy plan will allow students to have a reference to fall back on for all future practice with these problems.	"What's My Rule?", function machine		For Part 1, "What's My Rule?" prepare Teaching Masters of MM 425 & 426 (optional).	Find missing numbers for "What's My Rule?" problems.	TLG p153, "In No. 1, if you want to pay with the least coins possible, what coins would you use to pay $1.50? Explain."

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 5

Project 3	**NS 1.1** Count, read, and write whole numbers to 1,000 and identify the place value for each digit. **NS 2.0** Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers. **MG 1.4** Tell time to the nearest quarter hour and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year). **SDAP 1.1** Record numerical data in systematic ways, keeping track of what has been counted.	*Chinese Calendar* Counting up and back by 12s (Chinese calendar).				TLG p 448	
2♦12	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *NS 2.1 NS 2.3 SDAP 2.1*	Use counting-up and counting-back strategies to solve subtraction problems.	The Counting-Up Activity in Part 1 is extremely important to support the Focus Algorithm for Subtraction. Be sure your students are very comfortable with this method. Spend extra time if needed. **LIT** *The Hershey's Kiss Subtraction Book* by Jerry Cartwheel	difference	P2 *Beat the Calculator*: MRB p124-5, SMJ p24; **NS 1.3 NS 2.2** P3R *Difference Game*: MRB p130-1; (1st grade std.) P3E *Number-Grid Difference Game*: MRB p140-1, MM p418&463 **NS 2.2**	Before 2♦13, Part 2, have students prepare the Fact Triangles on Activity Sheets 3 & 4.	Write a fact family from a Fact Triangle.	TLG p158, "How does a doubles fact like the one in No. 1 help you solve other problems?"
2♦13	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *NS 2.3*	Use patterns in an addition facts table to develop automaticity with -9 & -8 facts.	As in lesson 2♦4, start with the Readiness Activity to provide a concrete model and rationale of the -9 and -8 shortcuts. Make sure students are familiar with this before memorizing the rule on the number grid.	-9 facts, -9 shortcut, -8 facts, -8 shortcut		For 3♦1, organize base-ten blocks for partners. See TLG p165.	Demonstrate understanding of the – and = symbols in solving subtraction problems.	

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 6

Unit 3: Place Value, Money, and Time	

Overview: To review place value in 2-digit and 3-digit numbers; to review coin values and exchanges among coins; to tell time and to write time in digital-clock notation; and to gather data by counting and to analyze data.

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. **Data:** Data can be collected, classified, analyzed & displayed using tables, charts & graphs.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
3♦1	**NS 1.2** Use words, models, and expanded forms (e.g., 45 = 4 tens + 5) to represent numbers (to 1,000). *NS 1.1 NS 2.2 MR 1.2*	Use base-10 blocks, drawings and digit cards to represent 2- and 3-digit numbers.	**2 Day Lesson** Begin to look for opportunities in Math Boxes where students can write numbers in expanded form in addition to what is required. For example in problem #3 in SMJ p84, #3 in SMJ p104, and #1&3 in SMJ p112. **LIT** *A Place for Zero: A Math Adventure* by Angeline Sparagna *For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*	base-10 system, cube, long, flat, base	P2 *Digit Game*: MRB p132-3 **NS 1.1 NS 1.3**	**2-Day Lesson** Prepare sets of Base-10 blocks for partners. Prepare teaching Master of Place-Value Mat. See TLG p184. **Planning Ahead:** For 3♦2, prepare poster or Teaching Master of MM p58.	Understand place value	
3♦2	**NS 5.0** Students model and solve problems by representing, adding, and subtracting amounts of money. *NS 5.1 NS 5.2 SDAP 2.1*	Draw coins to show coin combinations for priced market items.	Start with Play *Penny-Dime-Dollar Exchange* from the Readiness Activity to provide a connection between the place value model and money notation (decimals). Great opportunity to write equations similar to lesson 3♦1. (i.e. if you have one dollar, five dimes and 3 pennies, students can write 100+50+3=153 pennies or $1.53) This is the only time this game is referenced in second grade. Play it at least three more times during the year. **LIT** *26 Letters and 99 Cents* by Tara Hoban **LIT** *A Big Buck Adventure* by Shelley Gill and Deborah Tobola	nickel, penny, dime, quarter, $1 bill	P2 *Spinning for Money*: SMJ p55, MM p472; **NS 5.1** P3R *Penny-Nickel Exchange*: MRB p128-9, MM p428; **NS 5.1** P3R *Penny-Dime-Dollar Exchange*: MRB p144-5, MM p428 **NS 5.1**	For Part 1, prepare Teaching Master of MM p58, "Fruit and Vegetable Stand". **Planning Ahead:** Lesson 3♦2 requires a demonstration clock with hour hand only. Use MM p60 & a paper fastener or draw a clock face on the board. Prepare student clocks for tool-kits.	Find values of coin combinations.	
3♦A	**MG 1.4** Tell time to the nearest quarter hour and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year).	Show and tell time to the nearest quarter hour.	**Supplemental Lesson** to support Telling Time to the Minute **Gr1 Lesson 4♦8: Telling Time on the Quarter Hour** First Grade has focused on telling time to the hour and half-hour. This lesson was just touched on in grade 1 and will support the content on time coming up at this grade. Do all of Part 1					
3♦3	**MG 1.4** Tell time to the nearest quarter hour and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year). *NS 1.2 MG 1.5*	Show and tell time to the nearest 5-minute mark.	**Extension to 2 Days:** This is the last lesson that actively teaches time. Spend one day on "Estimating Time with an Hour Hand" only using the same vocabulary as Lesson 3♦A. Spend day two focusing on telling and writing time to the nearest five minutes. Begin having students write the time and date on each of their papers. Having an analog clock in your classroom, rather than a digital clock, is crucial. Also, provide practice during Daily Routines. **LIT** *Pigs on a Blanket* by Amy Axelrod	minute hand, hour hand, clock face, analog clock, digital clock		**2-day Lesson** Math Message uses student clocks. Use MM p61 to prepare take-home clocks for 3♦3 Home-Link.	Record tally marks and correctly group tallies by 5s.	TLG p200, "Explain how you found the answers to No. 3."

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 7

Lesson	Standard	Learning Target	Notes	Vocabulary	Games	Math Message/Masters	Mental Math	Writing/Reasoning
3•4	**NS 1.0** Students understand the relationship between numbers, quantities, and place value in whole numbers up to 1,000. *NS 1.2 NS 2.2 MG 1.4 MR 1.2*	Use base-10 drawings to represent 2-digit numbers (Exploration A).			P3R *Base-10 Exchange*: MM p428 **NS 1.2**		Show time to the nearest half-hour.	TLG p206, "Explain how you found how many more points Room 106 scored than Room 104 in No. 4."
3•5	**SDAP 1.0** Students collect numerical data and record, organize, display, and interpret the data on bar graphs and other representations. *NS 2.2 AF 1.3 SDAP 1.2 SDAP 1.3 SDAP 1.4*	Answer questions about pocket data represented on a tally chart and bar graph.	Reinforce interpreting the graphs. Although median is a fourth grade standard, it is grade level appropriate to introduce it at this time as the middle number of an ordered set of data. Have students include at least one base ten pictorial model when working with name collection boxes often. **LIT** *Bart's Amazing Charts* by Dianna Ochiltree	predict, middle number, bar graph, range	P2 *Dollar Rummy* (Complements of 10): SMJ p65, MM p454-5 **NS 5.1**	For Math Message, MM p71, 1 per 2 students. Teaching Masters of MM p72 & 72.	Show equivalent names for 20.	
3•6	**SDAP 2.0** Students demonstrate an understanding of patterns and how patterns grow and describe them in general ways. *NS 2.2 NS 5.2 SDAP 2.1*	Solve Frames-and-Arrows problems with 2 rules.				For Math Message, MM p75, 1 per 2 students. Prepare Teaching Master of MM p75 – 77 and 431, or draw a 2-rule Frames-and-Arrows	Create number patterns and rules in Frames-and-Arrows problems.	
3•7	**NS 5.0** Students model and solve problems by representing, adding, and subtracting amounts of money. *NS 2.2 NS 5.1 NS 5.2*	Use the counting-up method of subtraction to find differences between money amounts (make change).	This is a challenging lesson for students. Start small and model frequently. Consider adding "making change" problems to your Daily Routines.	make change by counting up	P2 *Digit Game*: MRB p132-3; **NS 1.1 NS 1.3** P3R *High Roller* **NS 1.3 NS 2.2**		Understand place value.	TLG p.222, "Explain how 6 + 8 helped you solve 80 + 60 in No. 4. How will this strategy help you solve 600 + 800?"
3•8	**NS 5.1** Solve problems using combinations of coins and bills. *NS 2.2 NS 5.0 NS 5.2*	Share and justify strategies to determine coin combinations for money amounts.	Model for students putting in exact change vs. not exact change so students can experience the difference first hand. Share and justify strategies are mentioned in several Learning Targets. At times, the TLG mentions sharing opportunities but there may not be a detailed description of a possible discussion. As part of High Leverage Moves, have more than one student not only share, but to also explain why or how they determined their responses. **LIT** *How Much is That Guinea Pig in the Window?* by Joanne Rocklin	exact change light		For Math Message Follow-Up, use document camera to display Master of MM p84.	Find values of coin combinations.	TLG p228, "Find how many children ate scoops of ice cream in No. 3. Explain how you found the answer."
Project 4	**NS 1.1** Count, read, and write whole numbers to 1,000 and identify the place value for each digit. **SDAP 1.1** Record numerical data in systematic ways, keeping track of what has been counted. **SDAP 1.4** Ask and answer simple questions related to data representations.	*Dates on Pennies* Reading 4-digit numbers in year notation.					See the discussion of Projects in the Management Guide section of TRM (p 14). You will need pennies too. TLG p 452	

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 8

Unit 4: Addition and Subtraction	

Overview: To solve number stories; to read and show temperatures; and to develop different strategies for adding 2- and 3-digit numbers.

Big Ideas	**Equivalence 1:** Any number or equation can be represented in multiple ways. **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. **Estimation:** A calculated guess can be made by using numbers that are close to actual numbers but easier to compute.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
4♦1	**AF 1.0** Students model, represent, and interpret number relationships to create and solve problems involving addition and subtraction. **NS 2.0 NS 2.2 NS 5.1**	Use change-to-more diagrams to solve addition stories.	*For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*	change-to-more number story, change diagram, mental arithmetic		Display a change diagram. See TLG p248 for options.	Solve number stories using manipulatives.	
4♦2	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. **AF 1.0** Students model, represent, and interpret number relationships to create and solve problems involving addition and subtraction. *NS 5.1 AF 1.3 MR 2.1*	Use parts-and-total diagrams to solve addition stories.		parts-and-total diagram, parts-and-total number story	P2 *Addition Spin*. MRB p120-1, MM p447-8 **NS 2.2 NS 1.3**	Display a parts-and-total diagram. See TLG p248 for options. For Part 3 (R) prepare paper plates for parts-and-total diagrams. **Planning Ahead:** Save extra MM copies for future lessons. Prepare Class Thermometer Poster. See TLG p 259.	Complete parts-and-total diagram with or without the help of number grid and/or manipulatives.	
4♦3	**NS 5.1** Solve problems using combinations of coins and bills. **MG 2.1** Describe and classify plane and solid geometric shapes (e.g., circle, triangle, square, rectangle, sphere, pyramid, cube, rectangular prism) according to the number and shape of faces, edges, and vertices.	Use Coin Stamp Booklets to create addition and subtraction word problems involving money.	**Combine** Lessons 4♦3 and 4♦4 into **one day**. For Lesson 4♦3, Skip Exploration A and Home-link. Do Exploration B and C. For lesson 4♦4, Skip Part 1. Combine Part 2 from both lessons 4♦3 and 4♦4. **LIT** *26 Letters and 99 Cents* by Tara Hoban	degrees Fahrenheit, degrees Celsius, thermometer, degree marks	P2 *Addition Spin*. MRB p120-1, MM p447-8 **NS 2.2 NS 1.3**		Write at least one equivalent name for $1.00.	TLG p264; "In No. 3, continue counting by 100s for five more spaces. What pattern do you see?"
4♦4	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *NS 2.0 NS 2.1 NS 2.2 NS 3.3 NS 5.2 MG 1.2 SDAP 2.1 MR 1.2*					Prepare for display of change diagrams. For Part 3 (R), paper copy and transparency of MM p101 for each child, MM p102, several copies, cut apart. Part 3 (E), 1 glass of ice water.	Read and show temperatures; solve temperature-change problems.	TLG p270, "Explain how you solved how much change LaVon will receive in No. 2."
4♦5	**NS 2.0** Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers. *NS 5.1 NS 6.0 SDAP 2.1 MR 2.1*	Share and justify strategies for estimating money amounts.	**LIT** *Betcha!* by Stuart J. Murphy	estimate, , less than (<), greater than (>), equal to (=)	P2 *Name That Number*. MRB p138-9, MM p462 **NS 1.2 AF 1.3**	Teaching copy of 4♦4 Home Link, MM p99-100. Part 3 (R), prepare pictures or index cards to match items on SMJ2, p 104.	Estimate	

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 9

4•6	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. **NS 2.3** Find the sum or difference of two whole numbers up to three digits long. **NS 5.0** Students model and solve problems by representing, adding, and subtracting amounts of money. *NS 1.1*	Share and justify strategies for adding 2-digit numbers.	**LIT** *Math Man* by Teri Daniels		P2 *Addition Spin*: MRB p120-1, MM p447-8 **NS 2.2 NS 1.3**	For Part 1, extra bills are on MM p459-461.	Tell time to the nearest quarter hour.	
4•7	**MG 1.3** Measure the length of an object to the nearest inch and/or centimeter. *NS 2.2 MG 2.0 MG 2.2*	Compare lengths when measured with different units (Pre-Explorations).	A critical discussion in this lesson occurs while examining the two scales before the exploration begins (top of TLG p284). It leads students to make a rule about inches vs. centimeters: "If you measure a length in centimeters you will get a larger number than with inches". Lead the discussion into making a generalization about how the size of the unit affects the measure number. The importance of this activity ties "estimating length" with a better sense of unit sizes leads to better estimates. **LIT** *A Cloak for the Dreamer* by Aileen Friedman **LIT** *Inch by Inch* by Leo Lionni	inch (in), centimeter (cm), tiling, attribute blocks		**EXPLORATIONS:** Spend most of your time on Explorations D & E. For EXPL. E, provide cardstock for tiling. EXPL. F, MM p107-8.	Record at least ten known subtraction facts.	TLG p286, "For No. 3, explain how you know a number is even or odd."
4•8	**NS 2.0** Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers. **NS 6.0** Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands places. *NS 2.2 MR 2.2*	Share and justify invented strategies for finding the sum of 2-digit numbers.	**Invented Strategies: 2-day Lesson.** Provide base-10 blocks to your students (see Adjusting the Activity TLG p290). A focus for the discussion is to identify similarities and differences between strategies. Encourage students to try a different strategy as they solve more problems. A 2nd grade goal is to have students develop their own conceptual models for multi-digit addition and subtraction. They will have plenty of time to learn algorithms in grade 3.	ballpark estimate	P2 *Fact Extension Game*: MRB p134-5 **NS 2.2 NS 1.3**	**2-day Lesson**	Make ballpark estimates.	TLG p292, "Explain how you know that your answer for No. 2 is correct."
4•9	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *NS 1.0 NS 2.0 MR 1.2*	Use base-10 blocks to model Partial-Sums for addition of 2-digit numbers.	**Extension to 3-day lesson.** Students really need time to understand a concrete model before moving onto an algorithm. Day 1: Start with Readiness Activity TLG p298. This is one of the few times available. Then do Math Message & follow-up and partial-sums introduction using base ten blocks. Day 2: Move to paper-and-pencil method. Day 3: Continue to practice and do Part 2 and the rest of Part 3.	algorithm	P2 *Fact Extension Game*: MRB p134-5 **NS 2.2 NS 1.3**	**3-day Lesson** Plan ahead for how to demonstrate partial-sums addition with base-10 blocks.	Solve addition of multi-digit multiples of ten.	TLG p298, "In No. 4, what time will it be in 12 hours? Explain how you solved this problem."

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 10

Unit 5: 3-D and 2-D Shapes	

Overview: To develop the concepts of point and line segment; to identify, name, and classify polygons; to observe similarities and differences among 3-dimensional shapes; and to explore symmetry.

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.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
5♦1	**NS 3.2** Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division. **MG 1.4** Tell time to the nearest quarter hour and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year). **MG 2.1** Describe and classify plane and solid geometric shapes (e.g., circle, triangle, square, rectangle, sphere, pyramid, cube, rectangular prism) according to the number and shape of faces, edges, and vertices. *NS 6.0*	Determine the attribute (rule) for a group of sorted 2-D shapes (Exploration A).	Do all explorations and use the Exploration C "Clock Concentration" activity for extra practice if needed. *For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*		P2 *Addition Spin*. MRB p120-1, MM p447-8 **NS 2.2 NS 1.3**	**EXPLORATIONS:** For Math Message and Part 1 prep, see TLG p 316 & 317. Plan to spend most of your time on Exploration A.	Read the time and match it to digital notation.	
5♦2	**MG 2.0** Students identify and describe the attributes of common figures in the plane and of common objects in space. **MR 1.2** Use tools, such as manipulatives or sketches, to model problems. *NS 2.2 AF 1.2*	Use a straightedge to draw a line segment between points.		point, straightedge, line segment, endpoint		Before 5♦6, collect objects for Shapes Museum. See TLG p326.	Use a straightedge to draw a line segment.	
5♦3	**MG 2.0** Students identify and describe the attributes of common figures in the plane and of common objects in space. **MR 1.2** Use tools, such as manipulatives or sketches, to model problems. *NS 5.1 AF 1.2 MG 2.1 MR 1.0*	Identify parallel line segments.		parallel			Identify parallel lines.	TLG p330, "Explain how you know that you made the largest number in No. 1."
5♦4	**NS 3.1** Use repeated addition, arrays, and counting by multiples to do multiplication. **MG 2.1** Describe and classify plane and solid geometric shapes (e.g., circle, triangle, square, rectangle, sphere, pyramid, cube, rectangular prism) according to the number and shape of faces, edges, and vertices. *NS 2.2 NS 3.0*	Find 2-D shapes that differ by at least one attribute (Exploration F).	**LIT** *The Greedy Triangle* by Marilyn Burns **LIT** *Shapes, Shapes ,Shapes* by Tara Hoban	trapezoid, rhombus, polygon, side, vertex, vertices, angle, triangle, quadrangle, pentagon, hexagon, heptagon, octagon	P2 *Dollar Rummy*. SMJ p65, MM p454-5 **NS 5.1**	**EXPLORATIONS:** Prepare word wall. Part 3 (EP) uses the book, *The Greedy Triangle*. For 5♦5, prepare MM p139 & 140 ahead of time. Prepare shapes ahead of time for 5♦5. See TLG p337.	Identify plane figures.	TLG p 336, "Explain how you know your numbers are even numbers in No. 3."

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 11

5♦5	**MG 2.0** Students identify and describe the attributes of common figures in the plane and of common objects in space. *NS 6.0 MG 2.1 MG 2.2*	Identify similarities and differences among attributes of quadrangles.	**Make this a 1 Day Lesson** Focus on the concept that shapes may have more than one name (see Note on margin of TLG p340). 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 so therefore can also be called parallelograms. **LIT** *Grandfather Tang's Story* by Amy Tompert **LIT** *Three Pigs, One Wolf and Seven Magic Shapes* by Grace Maccarone	square corner, square, rhombus, rectangle, trapezoid, parallelogram, kite	P2 *Name That Number*. MRB p138-9, MM p462 **NS 1.2 AF 1.3**	**2-day Lesson** Part 3 (E) uses Tangrams or MM p142 on cardstock.	Make reasonable estimates for addition problems.	TLG p 341, "Explain the strategy you used to fill in the number grid in No. 2."
5♦6	**MG 2.1** Describe and classify plane and solid geometric shapes (e.g., circle, triangle, square, rectangle, sphere, pyramid, cube, rectangular prism) according to the number and shape of faces, edges, and vertices. *NS 6.0 MG 2.0*	Use attribute descriptions to identify basic 3-D shapes.	**LIT** *The Art of Shapes: For Children and Adults* by Margaret Steele and Cindy Estes	cylinder, cone, sphere, curved surface, rectangular prism, cube, pyramid, flat surface, face, edge, vertex, vertices, congruent		Prepare poster of 3-D shapes with labels. Prepare labels for *Shapes Museum*. See TLG p326 & p343. Before 5♦7 prepare straws. See TLG p348.	Find the difference between two 2-digit numbers.	TLG p347, "How many children in all traveled to school in No. 3? Explain how you found your answer."
5♦7	**MG 2.1** Describe and classify plane and solid geometric shapes (e.g., circle, triangle, square, rectangle, sphere, pyramid, cube, rectangular prism) according to the number and shape of faces, edges, and vertices. *NS 2.2 MG 2.0 MR 1.2*	Use straws and twist-ties to make and describe different pyramids.	**2-Day Lesson**	base, apex, square pyramid, triangular pyramid, rectangular pyramid, pentagonal pyramid, hexagonal pyramid	P2 *Beat the Calculator*. MRB p124-5, SMJ p24 **NS 2.2 NS 1.3**	**2-Day Lesson** Prepare 8 straws and 12 twist-ties per student. Display 3-D Shapes Poster	Complete patterns on a number grid.	
5♦8	**MR 1.2** Use tools, such as manipulatives or sketches, to model problems. *NS 2.2 MR 1.0*	Complete shapes halved along a line of symmetry using a Pattern-Block template.	**Optional:** Although determining all lines of symmetry from triangles and quadrilaterals is a 4th grade standard, using folding strategies to determine more than one line of symmetry is appropriate exposure at 2nd grade.	line symmetry, line of symmetry, symmetrical	P2 *Fact Extension Game*: MRB p134-5 **NS 2.2 NS 1.3**	Make a triangular pyramid before 5♦7 Home-Link discussion.	Complete symmetric shapes.	
CA Project 10	**MG 2.2** Put shapes together and take them apart to form other shapes (e.g., two congruent right triangles can be arranged to form a rectangle).	*California Constructions* Put shape together and take them apart.				TLG p 468E		

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 12

Unit 6:	Whole-Number Operations and Number Stories	

Overview:	To introduce and practice array models; to review strategies for solving addition and subtraction problems; and to develop procedures for multiplication / division problems.

Big Ideas	**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. **Data:** Data can be collected, classified, analyzed & displayed using tables, charts & graphs.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
6♦1	**NS 2.0** Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers. *NS 2.2 AF 1.1 MR 1.0 MR 1.2*	Use the Associative Property as a strategy to solve problems with 3 or more addends.	A crucial component of this lesson should be to build the language and representation skills needed for students to adequately be able to share strategies with each other. *For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*		P1 *Three-Addends*: SMJ p131, MM p473 **AF 1.1**		Add three 1-digit numbers.	
6♦2	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. **AF 1.2** Relate problem situations to number sentences involving addition and subtraction. *NS 2.0 AF 1.0*	Use comparison diagram when solving number stories involving differences.	Problems #5-7 on SMJ p135 have students writing both addition and subtraction equations for each story. Plan to spend time discussing how each model interprets the number story.	comparison number story, difference, comparison diagram	P2 *Addition Top-It*: MRB p122-3, MM p449 **NS 2.2 NS 1.3**	See TLG p384 for suggestions on preparing a comparison diagram.	Solve comparison number stories.	TLG p388, "Explain how you know you have written all the possible coin combinations for 30¢ in No. 2."
6♦3	**SDAP 1.0** Students collect numerical data and record, organize, display, and interpret the data on bar graphs and other representations. **SDAP 1.1** Record numerical data in systematic ways, keeping track of what has been counted. *NS 2.2 AF 1.3 SDAP 1.2 SDAP 1.4*	Answer questions about data represented on a tally chart and bar graph.		basic food groups, data table, bar graph		For Part 1, prepare teaching masters or transparencies, MM p162-64.	Read graphs.	TLG p394, "In No. 2, How many more inches would you need to add to the line segment to make it 10 inches long? Write a number model."
6♦4	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. **AF 1.2** Relate problem situations to number sentences involving addition and subtraction. *AF 1.1 MR 1.0 MR 2.1*	Choose the most appropriate diagram when solving number stories (change, parts-and-total, or comparison).	**2-day Lesson** **Extension:** As stated on TLG p397 this is the first time students are deciding what operation to use to solve story problems. Start with whole group discussion using the Enrichment activity on TLG p400. Provide ample time having students share strategies that helped them make those decisions.			**2-day Lesson** For Part 1, prepare teaching master, transparency or poster of MM p437.	Solve number stories.	
6♦A	**NS 2.0** Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers. **NS 6.0** Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands places. *NS 2.2 MR 2.2*	Share and justify invented strategies for finding the difference of 2-digit numbers.	**Supplemental Activities for Subtraction Invented Strategies:** Just like students developed their own strategies for additions in lesson 4♦8, take the time to have students come up with their own strategies for multi-digit subtraction before showing them the EDM models. Provide students with a variety of materials including base-10 blocks, number grids, number lines, and counters. Again, make a record of what they share and focus the discussion on identifying similarities and differences between strategies. Encourage students to try a different strategy as they solve more problems. A 2nd grade goal is to have students develop their own conceptual models for multi-digit addition and subtraction. They will have plenty of time to learn algorithms in grade 3.			**1 Day Lesson**		

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 13

Lesson								
6♦5	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *NS 1.0 NS 2.0 MR 1.0 MR 1.2*	Use base-10 blocks to develop strategies for solving 2-digit by 2-digit subtraction problems.	Read the important NOTE on TLG p403. Between now and Unit 11 provide your students with plenty of opportunities to work, refine and discuss invented strategies.	trade (a base-10 long for 10 cubes)	P2 *Number-Grid Difference Game*: MRB p140-1, MM p463;(1st grade std.) P3R *Base-10 Trading Game*: MM p427 **NS 1.2**		Make a probability statement.	
6♦6	**NS 3.1** Use repeated addition, arrays, and counting by multiples to do multiplication. **NS 3.2** Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division. **NS 5.1** Solve problems using combinations of coins and bills. *NS 6.0*	Use geoboards to model multiplication arrays (Exploration A).	Arrays are closely connected to the area model of multiplication. Putting rubber bands around geoboard pegs creates a perimeter, but the area of the rectangle created no longer matches the array (number of pegs inside). For example the 2X5 array in MM p172 shows a rectangle that really has an area of 4 squares. This may create confusion later on. Place counters (pennies) inside the squares and count those instead of the geoboard pegs. A 2X5 array should be represented like the graphic here.		P2 *Three-Addends*: SMJ p131, MM p473 **AF 1.1**	**EXPLORATIONS:** Plan to spend most of the time on Exploration A. MM p172, 175, & 176 give directions for the Explorations.	Make bill and coin exchanges.	TLG p410, No. 2, "Draw a shape that has one line of symmetry. Next, draw another shape that has more than one line of symmetry."
6♦7	**NS 3.1** Use repeated addition, arrays, and counting by multiples to do multiplication. *NS 2.2 NS 3.0 MR 1.2*	Solve multiplication number stories using "equal group" counting strategies.	**LIT** *Each Orange Had Eight Slices: A Counting Book* by Paul Gigante	equal groups, multiplication, times, multiplied by		Part 3 (EP), uses the book *Each Orange Had Eight Slices*.	Combine equal groups to find totals.	TLG p416, "In No. 5, if Lauren was born the same year as you, is she older or younger? What strategy did you use to solve the problem?"
6♦8	**NS 3.1** Use repeated addition, arrays, and counting by multiples to do multiplication. *NS 3.0 MR 1.2*	Solve multiplication number stories using an array model and multiplication diagrams.	**LIT** *Sea Squares* by Joy N. Hulme **LIT** *Amanda Bean's Amazing Dream* by Cindy Neuschwander	multiplication diagram, x-by-y array	P2 *Fact Extension Game*: MRB p134-5; **NS 2.2 NS 1.3** P3R *Simon Says* **NS 3.1**	For Part 1, MM p438, use transparency or create wall chart for multiplication models.	Show arrays.	
6♦9	**NS 3.1** Use repeated addition, arrays, and counting by multiples to do multiplication. *NS 2.2 NS 3.0 MR 1.2*	Use array cards to develop visual automaticity with some basic multiplication facts (*Array Bingo*).	See comments for 6♦6 to adjust Home Link for this lesson. **LIT** *The King's Commissioners* by Aileen Freidman **LIT** *One Hundred Hungry Ants* by Elinor J. Pinczes		P1, *2 Array Bingo*: SMJ p154-5, MM p450 **NS 3.1**	Part 1, *Array Bingo* uses MM p450 copied on cardstock, cut apart and stored.	Draw and measure a 3-inch line segment.	
6♦10	**NS 3.2** Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division. *NS 3.0 AF 1.1 MR 1.2*	Model equal sharing to solve division problems with and without remainders.		division, equal sharing, remainder, equal grouping	P2 *Number-Grid Difference Game*: MRB p140-1, MM p418&463 **NS 2.2**		Solve equal-sharing problems.	
Project 5	**NS 4.1** Recognize, name, and compare unit fractions from 1/12 to 1/2. **MG 2.0** Students identify and describe the attributes of common figures in the plane and of common objects in space.	*Snowflakes* Experiment with folding.					Adult assistance (or older students) will make your life easier (TLG p 455).	

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 14

Unit 7: Patterns and Rules								
Overview: To describe patterns that result from skip counting by 2s, 5s, and 10s; to build mental arithmetic skills for adding 1- and 2-digit numbers; and to make frequency tables, line plots, and bar graphs from real-life data.								
Big Ideas	**Patterns:** Patterns repeat and can be extended in predictable ways. **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. **Data:** Data can be collected, classified, analyzed & displayed using tables, charts & graphs.							

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
7♦1	**SDAP 2.1** Recognize, describe, and extend patterns and determine a next term in linear patterns (e.g., 4, 8, 12 . . . ; the number of ears on one horse, two horses, three horses, four horses). *NS 1.1 NS 3.1*	Identify patterns on a number grid when skip counting by different numbers.	**LIT** *The Grapes of Math* by Greg Tang *For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*	multiple of 10		For Part 1, make extra copies of MM p195 plus teaching master or transparency.	Count by 2s.	TLG p547, "Describe any patterns you see in No. 2."
7♦2	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *NS 1.1 NS 5.0 SDAP 2.1*	Use complements of 10 to change numbers to and from multiples of 10 (see commentary for Lesson 1♦A).	**Modification:** Provide a number line to conceptually support *Hit the Target*. Encourage students to use complements of ten for their first change. For example on SMJ p163, the first table shows +38 as the first change; encourage your students to use +8 instead. This sets the seeds for later development of the Counting-Up Strategy for multi-digit subtraction.		P1 *Hit the Target*: MRB p136-7, MF p163, MM p418&457 **NS 2.2**		Find the difference between 2-digit numbers and higher multiples of 10.	
7♦3	**NS 2.0** Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers. **AF 1.1** Use the commutative and associative rules to simplify mental calculations and to check results. *NS 2.2 NS 2.3 MR 2.1*	Share and justify strategies for adding 3 or more numbers.	Provide ample time for students to share addition strategies (see #4 TLG p556). Provide number grids base-10 blocks to help students.		P1 *Basketball Addition*: SMJ p166-7, MM p200, 418&451 **NS 2.2 AF 1.1**	For *Basketball Addition*, prepare class chart of scoreboard MM p200 or SMJ p167, or transparency.	Solve addition problems with multiple addends.	
7♦4	**SDAP 2.1** Recognize, describe, and extend patterns and determine a next term in linear patterns (e.g., 4, 8, 12 . . . ; the number of ears on one horse, two horses, three horses, four horses). *NS 3.1 NS 3.2 AF 1.1*	Find and record patterns for doubling and halving.	Literature Link: If possible read *One Grain of Rice* by Demi to reinforce the concept of doubling. Students can use a calculator to follow the events of the story. Four other literature connections are mentioned in the TLG p 539.	half, double	P2 *Hit the Target*: MRB p136-7, MM p418&457 **NS 2.2**	For 7♦5, collect books of varying weights and analog bath scale. See TLG p564 for details. *One Grain of Rice* by Demi.	Use rules to find patterns.	TLG p563, "Explain how you figured out how many groups of 3 you could make with the 29 counters in No. 1."
Project 7	**SDAP 1.1** Record numerical data in systematic ways, keeping track of what has been counted. **SDAP 2.0** Students demonstrate an understanding of patterns and how patterns grow and describe them in general ways.	*Collections* Describe collections using numbers, size, age, and other attributes.				See the TLG for more specific information. A letter will need to be sent home in advance. TLG p 937		

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 15

7◆5	**NS 3.2** Use repeated subtraction, equal sharing, and forming equal groups with remainders to do division. **NS 5.1** Solve problems using combinations of coins and bills. *NS 3.0 NS 5.2 SDAP 2.1*	Use pattern blocks to create and record visual patterns- tessellations (Exploration C).	Bring in a bath scale for the students to use; part 3 Readiness as a 4th station. **LIT** *A Cloak for the Dreamer* by Aileen Friedman		P2 *Hit the Target.* MRB p136-7, MM p418&457 **NS 2.2**	**EXPLORATIONS:** For Math Message, have a 1 pound and a 3 pound book available.	Create an array.	
7◆6	**MG 1.3** Measure the length of an object to the nearest inch and/or centimeter. **SDAP 1.0** Students collect numerical data and record, organize, display, and interpret the data on bar graphs and other representations. *NS 2.2 MG 1.2 MR 2.2*	Develop routines and procedures for consistent and accurate use of measuring tools.		arm span	P2 *Array Bingo.* SMJ p154-5, MM p450 **NS 3.1**	For Math Message, prepare stick figure diagram from TLG p571. Part 1, mark several "starting" lines on floor with masking tape for long jump activity, or go outside.	Understand units of lengths.	
7◆7	**SDAP 1.1** Record numerical data in systematic ways, keeping track of what has been counted. *NS 2.2 SDAP 1.3 SDAP 1.4*	Use a concrete model to find the median of a set of data.	Although median is a 4th grade vocabulary word the introduction of the concept of the middle value is appropriate as a way to analyze data.	median, middle value, sort (the data)		For Math Message, prepare half-sheets of paper for recording. Prepare 20-foot baseline on floor. See TLG p576 & 578.	Tell time to the quarter-hour.	TLG p580, "Tell the time 2 hours later than the time shown in No. 1. How did you figure it out?"
7◆8	**SDAP 1.2** Represent the same data set in more than one way (e.g., bar graphs and charts with tallies). *SDAP 1.3 SDAP 1.4*	Use collected data to create frequency tables, line plots and bar graphs.	**Keep this a 1 Day Lesson** **LIT** *Bart's Amazing Charts* by Diane Ochiltree **LIT** *Probably Pistachio* by Stuart J. Murphy	line plot	P2 *Soccer Spin.* SMJ p179, MM p470-1 **SDAP 1.1**	**Possible 2-Day Lesson**: Math Message requires sticky notes for recording arm-span. For Part 1, prepare Teaching Masters, transparencies or charts of MM p219 & 220.	Find the median.	TLG p586, "In No. 5, explain how you used your ballpark estimate to check your answer."
Project 1	**NS 4.1** Recognize, name, and compare unit fractions from 1⁄12 to 1⁄2. **MG 2.0** Students identify and describe the attributes of common figures in the plane and of common objects in space.	*Boxes, Boxes, Beautiful Boxes* Name fractional parts based on folding.				TLG p 914		

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 16

Unit 8:	Fractions		

Overview: To review basic fraction concepts; to use fractions to name parts of a whole and of a collection; to find pairs of equivalent fractions; and to solve number stories involving fractions.

Big Ideas   **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. **Number 2:** A fraction represents a comparison of a part to the whole (region, set, segment).

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
8♦1	**NS 4.2** Recognize fractions of a whole and parts of a group (e.g., one-fourth of a pie, two thirds of 15 balls). **NS 4.3** Know that when all fractional parts are included, such as four-fourths, the result is equal to the whole and to one. *NS 3.0 NS 4.0 NS 4.1*	Use folded paper and colors to find and name fractional parts of a whole.	Start with the Readiness Activity to provide a solid conceptual introduction. Note typo: top of TLG p606. MRB pages should be 12-15 or at least 12-13. **LIT** *Ed Emberley's Picture Pie: A Circle Drawing Book* by Ed Emberley **LIT** *Eating Fractions* by Bruce McMillan **LIT** *Give Me Half* by Stuart J.Murphy *For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*	congruent, ONE (the whole), fraction, denominator, numerator		Before Math Message, prepare three, 8" paper squares per student. Read TLG p603, Fractions Museum before distributing Home-Link 8♦1. Part 3 (EP) uses the book Ed Emberley's *Picture Pie*.	Model fractions as equal parts of a region.	TLG p608, "How did you figure the **in** number in No. 3 when you only knew the **out** number? Explain your strategy."
8♦2	**NS 4.1** Recognize, name, and compare unit fractions from 1⁄12 to 1⁄2. *NS 3.1 NS 4.2 NS 4.3 MG 2.2 SDAP 1.3*	Use pattern blocks to compare fractional parts with varied representations of ONE (Exploration A).		cubic centimeter, volume		**EXPLORATIONS:** Prepare area for Fractions Museum in classroom.	Record addition and subtraction facts.	TLG p614, "Explain how you knew how many dots to color green in No. 4."
8♦3	**NS 4.2** Recognize fractions of a whole and parts of a group (e.g., one-fourth of a pie, two thirds of 15 balls). *NS 4.1 NS 4.3 MR 1.2*	Use manipulatives to find and name fractional parts of a set.	**LIT** *One by One* by MArc Harshman **LIT** *The Hershey's Milk Chocolate Bar Fractions Book* and/or *Apple Fractions* by Jerry Pallotta				Calculate coin combinations.	
8♦4	**NS 4.1** Recognize, name, and compare unit fractions from 1⁄12 to 1⁄2. *NS 4.2 NS 4.3 MR 1.2*	Use manipulatives to find and name equivalent fractions.		equivalent, equivalent fractions	P2 *Name That Number*: MRB p138-9, MM p462 **NS 2.2 AF 1.3**	Math Message uses MM p239, one per student plus extras. Part 1 uses fraction circles (commercial) or cut from MM p239 for teacher modeling.	Identify the value of digits.	
8♦5	**NS 4.1** Recognize, name, and compare unit fractions from 1⁄12 to 1⁄2. **NS 4.3** Know that when all fractional parts are included, such as four-fourths, the result is equal to the whole and to one. *SDAP 1.3 MR 1.2*	Use fraction cards to share and justify strategies for determining fractional equivalencies.	**Caution:** The activities in these lessons are extremely valuable in order to support the fraction work students need to master in 3rd grade. A goal for 2nd grade is to provide ample opportunity for students to engage in discussions about fraction concepts with each other in a safe environment. Note that mastery is not required at this point. Look at all Readiness Activities for additional support.		P1 *Equivalent Fractions Game*: SMJ p198-9 **NS 4.1**	Use SMJ, Activity Sheets 5 & 6 (with storage bag or paper clips) or matching Everyday Math Deck cards.	Record equivalent fraction pairs.	TLG p629, "Describe how you found the arrow rules in No. 3."
8♦6	**NS 4.1** Recognize, name, and compare unit fractions from 1⁄12 to 1⁄2. *NS 2.2 NS 4.3 MR 1.2 MR 2.1*	Use fraction cards to share and justify strategies for comparing fractions.		unit fraction	P1 *Fraction Top-It*: SMJ p203-4; **NS 4.1** P2 *Equivalent Fractions Game*: SMJ p198-9 **NS 4.1**		Identify units of time.	

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 17

8•7	**NS 4.2** Recognize fractions of a whole and parts of a group (e.g., one-fourth of a pie, two thirds of 15 balls). *NS 4.3 MR 1.2 MR 2.0*	Solve number stories involving fractions.	Be sure your students use counters and record their pictures when solving number stories. **LIT** *Fraction Action* by Loreen Leedy		P2 *Fraction Top-It.* SMJ p203-4 **NS 4.1**	Before Part 1, SMJ p206, create and pose additional fraction number stories as needed. Use similar problems in future Mental Math and Reflexes sessions.	Solve fraction number stories.	

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**Flores, Canterbury, Fundanet,
and Preston**

**Grade 2
Page 18**

Unit 9:	Measurement		

Overview: To review measuring with yards and meters; to measure longer distances; to develop the concepts of perimeter and area; and to know units of weight.

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. **Estimation:** A calculated guess can be made by using numbers that are close to actual numbers but easier to compute.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
9♦1	**MG 1.1** Measure the length of objects by iterating (repeating) a nonstandard or standard unit. *NS 6.1 SDAP 1.3 MR 1.2*	Share examples of when a standard unit may be necessary over a non-standard unit.	**LIT** *How Big is a Foot?* by Rolf Myller *For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*	standard unit, yard, meter		Part 1 requires an actual yard stick (36" long) and a meter stick. For Part 3 (E), create masking tape paths. See TLG p660. **Planning Ahead:** For 9♦2, gather materials for Measures All Around Museum.	Find the mode.	TLG p664, "Explain how you found the median in No. 4."
9♦2	**MG 1.3** Measure the length of an object to the nearest inch and/or centimeter. *NS 4.2 MG 1.2*	Use rulers to measure objects to the nearest inch, foot, centimeter, and decimeter.	Have students compare their measurement in inches to their measurement in centimeters. Ask students why the results are different. **LIT** *Twelve Snails to One Lizard* by Susan Hightower	inch, centimeter, foot, decimeter	P2 *Name That Number*: MRB p138-9, MM p462 **NS 2.2 AF 1.3**	Set up Museum. For Part 3 (ELL), collect materials and create posters. **Planning Ahead:** Organize boxes students brought for 9♦4. See TLG p671.	Use a ruler.	
9♦3	**MG 1.1** Measure the length of objects by iterating (repeating) a nonstandard or standard unit. *NS 4.3 NS 6.1 MG 1.3*	Use ruler enlargements to identify fractional parts of an inch and centimeter.	For SMJ p214 students work as partners for problems #1-3. Do problem #4 whole class. **LIT** *Inchworm and a Half* by Elinor J. Pinczes	millimeter	P2 *Equivalent Fractions Game*: SMJ p198-9 **NS 4.1**	For Part 1, MM p260 & 261 will be helpful for teacher demo. For Part 3 (R) and (E) activities see prep TLG p672.	Measure to the nearest inch.	
9♦4	**MG 1.3** Measure the length of an object to the nearest inch and/or centimeter. *NS 4.2 MG 1.1*	Find the perimeter of polygons by measuring all sides and adding them up.		perimeter	P2 *Number-Grid Difference Game*: MRB p140-1, MM p417&463 **NS 2.2**	For Math Message, MM p267, 1 per 4 students, cut apart.	Measure to the nearest inch.	TLG p681, "Explain how you knew what numbers to fill in on the number grid in No. 1."
9♦5	**MG 1.1** Measure the length of objects by iterating (repeating) a nonstandard or standard unit. *NS 4.2 NS 6.1 MR 1.0*	Share and justify examples of when miles/kilometers should be used for measurement.	This is an introduction to larger units of mile and kilometer which are used for lengths that are too big for a ruler. Provide a calculator to assist with SMJ p218.	mile, kilometer			Understand fractions as equal parts of a collection.	

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 19

9♦6	**MG 1.0** Students understand that measurement is accomplished by identifying a unit of measure, iterating (repeating) that unit, and comparing it to the item to be measured. *NS 4.1*	Count unit squares to find area of a rectangle (Exploration B).	**Optional Lesson:** Exploration B provides a brief introduction to area. At this point students should be able to rely on merely counting squares to determine area, so choose objects that trace exactly on the gridlines (not the EDM deck) For example a small post-it is 4x5 cm, a small square attribute block is 3x3 cm, the rectangle from their template is 4x2 cm, and the bottom of a box of thick school markers is 7x5 cm. Otherwise students can draw their own rectangles along the lines. For Exploration A, find 2 containers (one tall & skinny and one short & wide) instead of using the paper. **LIT** *Millions to Measure* by David Schwartz	area, square centimeter, square inch		**EXPLORATIONS:** MM p275 – 280, 1 per student. Exploration A requires adult help. Exploration B is background for the next lesson and covers material assessed at end of unit. Exploration C requires an assortment of measuring tools. **Planning Ahead:** Lesson 9♦7, Part 3 (EP) requires a chess board.	Record addition and subtraction facts.	TLG p692, "Describe how you determined the perimeter of the rectangle in No. 4."
9♦7	**MG 1.0** Students understand that measurement is accomplished by identifying a unit of measure, iterating (repeating) that unit, and comparing it to the item to be measured. *NS 4.1 MG 2.1*	Count unit squares to find area of figures that follow unit gridlines (Readiness & Extra Practice).	**Touch & Go:** These lessons are exposure and support the work in grades above. Do them as written but do not expect mastery.	surface, square unit	P2 *Fraction Top-It*. SMJ p203-4; **NS 4.1** P2 *Equivalent Fractions Game*: SMJ p198-9 **NS 4.1**	**Planning Ahead:** Lesson 9♦8 requires an assortment of containers with original labels & measuring materials. Lesson 9♦9 requires, per group, a spring scale, 40 pennies and a holding cup. See TLG p698.	Understand equal shares.	TLG p697, "Explain your answer to No. 4."
9♦8	**MG 1.0** Students understand that measurement is accomplished by identifying a unit of measure, iterating (repeating) that unit, and comparing it to the item to be measured. *NS 4.2*	Use a graphic representation to determine relationships between US Customary units of capacity.	The graphic representation for capacity on TLG p701 should be an anchor chart. **LIT** *Spaghetti and Meatballs for All* by Marilyn Burns **LIT** *Pigs in a Pantry: Fun with Math and Cooking* by Amy Axelrod **LIT** *Measuring Penny* by Loreen Leedy	capacity, cup, pint, quart, gallon, liter		Part 3, (E) requires advanced set-up. See TLG p699 & 704. **Planning Ahead:** For Lesson 9♦9, collect items that weigh less than 1 lb. Home-Link discussion requires measuring spoons and cups and scales. See TLG p704.	Continue numerical patterns.	
9♦9	**MG 1.0** Students understand that measurement is accomplished by identifying a unit of measure, iterating (repeating) that unit, and comparing it to the item to be measured. **MR 1.1** Determine the approach, materials, and strategies to be used. *NS 6.1 MR 3.0*	Use a spring scale to weigh objects (< 1lb).		weigh, scale, weight, ounce, pound, gram, kilogram	P2 *Name That Number*. MRB p138-9, MM p462 **NS 2.2 AF 1.3**	See TLG p705 for Math Message preparation. For Part 1, attach holding cups to spring scales.	Write number sentences, generate equivalent names for numbers.	
Project 2	**MG 1.0** Students understand that measurement is accomplished by identifying a unit of measure, iterating (repeating) that unit, and comparing it to the item to be measured. **SDAP 1.1** Record numerical data in systematic ways, keeping track of what has been counted.	*Weather Station* Read thermometers using 2 scales (C & F).				TLG p 918		

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Flores, Canterbury, Fundanet, and Preston

Grade 2 Page 20

Unit 10: Decimals and Place Value	

Overview: To review notation and equivalencies for money amounts; to provide experiences with comparing prices, estimating costs, and making change; and to develop and extend place-value concepts.

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. **Estimation:** A calculated guess can be made by using numbers that are close to actual numbers but easier to compute.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
10●1	**NS 5.1** Solve problems using combinations of coins and bills. *NS 2.1 NS 4.1 NS 5.0 NS 5.2*	Use coins and bills to make equivalent values to purchase "store" items.	**LIT** *Sold!* by Nathan Zimelman *For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*		P2 *Spinning for Money*. SMJ1 p55, MM p472 **NS 5.1**	For Part 1, MM p441, 1 copy. The Game in Part 2, "*Spinning for Money*" can reuse the spinners from Unit 3, or prepare new ones from MM p472.	Count coin and bill combinations.	
10●2	**NS 5.2** Know and use the decimal notation and the dollar and cent symbols for money. *NS 4.2 NS 5.0 NS 5.1 NS 6.0*	Use both $ notation and ¢ notation to represent money amounts.	**LIT** *26 Letters and 99 Cents* by Tara Hoban	decimal point		Part 3 (R), prepare a 10 X 10 grid from 2 copies of MM p299.	Estimate the combined value of two items.	
10●3	**NS 5.1** Solve problems using combinations of coins and bills. *NS 5.2 SDAP 1.1 MR 1.2*	Calculate values of coin and bill combinations entered in a table (*Pick-a-Coin*).	**Combine** calculator activities into a one day Part 1. Focus the discussion on dollar-and-cent ($) notation and how it differs from decimal notation in that it must be written to 2 place values (i.e. it's $0.60 not $.6).		P1 *Pick-a-Coin*. SMJ p236-7, MM p469 **NS 5.1 NS 5.2**	For Part 1 an overhead calculator is useful. For game, *Pick-a-Coin*, MM p469, extra copies plus teaching master (and for Lesson 10●4)	Model fractions as equal parts of a collection.	TLG p741, "Explain why the number of nickels in $3.00 is double the number of dimes in $3.00 in No. 1."
10●4	**NS 5.1** Solve problems using combinations of coins and bills. *NS 2.1 NS 5.0 NS 5.2 MR 1.1 MR 1.2 MR 2.0*		**LIT** *Math Man* by Teri Daniels		P2 *Pick-a-Coin*. SMJ p236-7, MM p469 **NS 5.1 NS 5.2**		Calculate coin and bill combinations.	TLG p746, "Describe the steps you took to find the median in No. 3"
Project 8	**MG 1.1** Measure the length of objects by iterating (repeating) a nonstandard or standard unit. **SDAP 1.1** Record numerical data in systematic ways, keeping track of what has been counted. **SDAP 1.3** Identify features of data sets (range and mode).	*How Far Can I Run in 10 Seconds?* Measure distance using standard measures.				Perhaps get the PE specialist to help with the activity's data collection. TLG p 940		
10●5	**NS 5.0** Students model and solve problems by representing, adding, and subtracting amounts of money. **NS 5.1** Solve problems using combinations of coins and bills. **NS 6.0** Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands place. *NS 2.1 NS 5.2 MR 1.2 MR 2.0*	Share and justify strategies for rounding numbers to the nearest 10 (Readiness).	Start with the Readiness Activity to introduce rounding) and then have students use rounding to make estimates during Part 1. Caution: make sure that students round the addends and not just the result of their calculation. **LIT** *Betcha* by Stuart J. Murphy			Part 1, provide extra copies of the "Good Buys" poster, MM p441, so students don't have to flip back in their SMJs. Save them for 10●6.	Identify a rule for a function.	

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Flores, Canterbury, Fundanet, and Preston

Grade 2 Page 21

Lesson	Standards		Modification/Notes	Vocabulary	Games	Preparation	Objective	Extension
10◆6	**NS 5.0** Students model and solve problems by representing, adding, and subtracting amounts of money. **NS 5.1** Solve problems using combinations of coins and bills. **NS 6.0**	Use counting-up method for subtraction to make change for money amounts.	**Modification:** Have students pick only one item that is less than a dollar and then make change from $1.00 and use counting up strategies to 100 cents. Use Readiness Activity to help with this. **LIT** *Alexander, Who Used to Be Rich Last Sunday* by Judith Viorst **LIT** *Follow the Money* by Loreen Leedy	counting up to make change	P2 *Equivalent Fractions Game*: SMJ p198-9; **NS 4.1** P2 *Fraction Top-It*: SMJ p203-4 **NS 4.1**	Math Message is also on MM p310, 1 per 2 students, cut apart.	Read the temperature.	TLG p756, "In No. 3, what temperature would it be if it were 20°F warmer? Show your work and explain what you did."
10◆7	**MG 2.2** Put shapes together and take them apart to form other shapes (e.g., two congruent right triangles can be arranged to form a rectangle). *NS 4.2 SDAP 1.3 MR 1.2*	Use pattern block trapezoids to model different polygons (Exploration B).	**Optional:** Exploration B is the only activity which supports grade level standards.			**EXPLORATIONS:** Math Message is also on MM p313, 1 per 4 students, cut apart. **Planning Ahead**: Choose from 3 versions, then prepare Place-Value tools for Lesson 10◆9. See TLG p763. Read assembly directions in TLG p770-771.	Know basic addition and subtraction facts.	
10◆8	**NS 1.1** Count, read, and write whole numbers to 1,000 and identify the place value for each digit. **NS 1.2** Use words, models, and expanded forms (e.g., 45 = 4 tens + 5) to represent numbers (to 1,000). *NS 2.1 NS 5.0 NS 6.0*	Use base-10 blocks to represent 3- and 4- digit numbers.	Have students write numbers in expanded form during the first activity in Part 1. **LIT** *How Much, How Many, How Far, How Heavy, How Long, How Tall is 1000?* by Helen Nolan	flat, long, cube, place value, big cube	P1 *Money Exchange Game*: SMJ p253-4, MM p321 **NS 5.1**	For Math Message, display 1 each of base-10 blocks. For Part 1, teaching master of MM p320 & 321.	Estimate change.	
10◆9	**NS 1.1** Count, read, and write whole numbers to 1,000 and identify the place value for each digit. *NS 1.2 NS 6.0*	Use a Place-Value Book to display and read 3- and 4-digit numbers.	The Routines from Part 2 are extremely valuable to support place value. Incorporate them regularly into your Daily Routines from now on.	ones, tens, hundreds, thousands, ten-thousands		To prepare demo model of place-value tools, use MM p330-336. Paper Card Holder uses 5 copies of MM p327 for repeated digits.	Understand units of time.	TLG p773, "Make up a "What's My Rule?" table like the one in No. 4, using 3 feet = 1 yard as the rule. Fill in all of the **in** and **out** numbers."
10◆10	**NS 1.0** Students understand the relationship between numbers, quantities, and place value in whole numbers up to 1,000. *NS 1.1 NS 1.2 MR 1.2*	Solve place value problems with 4- and 5-digit numbers using a Place-Value-Book.	**LIT** *On Beyond a Million* by David M. Schwartz **LIT** *Count to a Million* by Jerry Pallotta **LIT** *How Much is a Million?* by David M. Schwartz	ten-thousands (10,000s)			Identify the value of digits.	TLG p778, "Explain how you found the correct amount of change in No. 2"
10◆11	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. **AF 1.1** Use the commutative and associative rules to simplify mental calculations and to check results. *NS 1.1 NS 3.0*	Solve problems involving parentheses.	**Optional:** Part 1. Solving problems with parentheses is a 4th grade standard. Do all of Part 2.	parentheses, parenthesis	P2 *Soccer Spin*: SMJ p179, MM p470-1 **SDAP 1.1**		Identify fractions of collections.	

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Flores, Canterbury, Fundanet, and Preston

Grade 2 Page 22

Unit 11: Whole-Number Operations Revisited	

Overview: To review addition and subtraction algorithms using sums of money; to introduce and practice the trade-first subtraction algorithm; to solve multiplication and division number stories; and to practice multiplication and division facts using a products table and fact families.

Big Ideas	**Equivalence 1:** Any number or equation can be represented in multiple ways. **Equivalence 2:** Numbers represent values that can be put together and taken apart. **Number Relationships:** Addition and subtraction are inverse operations of each other and multiplication and division are inverse operations of each other.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
11♦1	**NS 2.0** Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers. *NS 1.1 NS 5.1 NS 5.2 MR 2.0 MR 2.1*	Share and justify strategies for solving addition problems involving money.	**Optional** Lessons: The number combinations and the use of decimal go beyond what is appropriate for grade level. Play *Hit the Target*. **LIT** *Ben Franklin and the Magic Square* by Frank Murphy		P2 *Hit the Target*. MRB p136-7, MM p418&457 **NS 2.2**		Find differences between 2-digit numbers.	TLG p805, "Explain how you solved No. 5."
11♦2	**NS 2.0** Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers. *NS 5.1 NS 5.2 MG 1.4 MR 1.1 MR 2.0*	Share counting up strategies for solving subtraction problems involving money.	*For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*				Tell time to the nearest 5 minutes.	
11♦3	**NS 2.2** Find the sum or difference of two whole numbers up to three digits long. *NS 2.0 NS 6.0 MR 2.0*	Solve subtraction problems using the Trade-First algorithm.	By this time students should have had plenty of time developing invented strategies. It is appropriate at this time to introduce an algorithm. Have base-10 blocks available.	algorithm, trade-first (subtraction)			Use strategies for subtraction problems involving two digits.	
11♦4	**NS 3.1** Use repeated addition, arrays, and counting by multiples to do multiplication. *NS 3.0 NS 5.2 NS 6.0 MR 1.2*	Share and justify strategies for solving number stories involving equal groups.	Start with the Readiness Activity to provide a model for multiplication (repeated addition) students have not seen before. **LIT** *Each Orange Had Eight Slice* by Paul Gigante **LIT** *One Hundred Hungry Ants* by Elinor J. Pinczes	multiplication diagram, per, in each, for each, factor, product, rate multiplication stories	P2 *Array Bingo*. SMJ1 p154, MM p450 **NS 3.1**	Before Part 1, decide how to display a multiplication diagram. See TLG p818. Part 3 (EP) uses the book, *Each Orange Had Eight Slices.*	Solve problems involving equal groups.	TLG p822, "Describe how you shared the baseball cards equally in No. 4."
11♦5	**NS 3.0** Students model and solve simple problems involving multiplication and division. *NS 3.1 NS 3.2*	Use equal sharing models to solve division number stories.	Start with the Readiness Activity to provide students with an opportunity to model equal sharing with manipulatives. **LIT** *A Remainder of One* by Elinor J. Pinczes	multiplication/division diagram, division, quotient, remainder, divided by	P2 *Soccer Spin*. SMJ p179, MM p470-1 **SDAP 1.1**	This lesson uses the Multiplication diagram from 11♦4. Part 3 (EP) uses the book, "A Remainder of One".	Understand equal sharing.	
11♦6	**NS 3.3** Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory. *NS 3.0 NS 3.1 SDAP 2.1*	Use skip-counting to develop automaticity with multiplication facts (2s, 5s & 10s).		multiplication fact, fact power	P2 *Name That Number*. MRB p138-9, MM p462 **NS 2.2 AF 1.3**		Draw an array to answer a multiplication problem.	TLG p833, "Describe how you found ½ of the counters in No. 4."

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11◆7	**NS 3.3** Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory. *NS 3.0 NS 3.1 NS 3.2 SDAP 2.1 MR 1.2*	Find patterns in a Products Table.	**LIT** *Sea Squares* by Joy N. Hulme	square (of a number), turn-around rule for multiplication		A teaching master or poster of MM p443 might be helpful for introducing the Products Table activity.	Measure to the nearest inch.	
11◆8	**NS 3.0** Students model and solve simple problems involving multiplication and division. *NS 3.1 NS 3.2 NS 3.3*	Use fact triangles to write equations for multiplication/ division fact families.		fact family		**2-Day Lesson** Prepare multiplication/division diagram and a Fact Triangle for teaching masters. MM p442 & 444.	Find the median of a set of data.	
11◆9	**NS 3.3** Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory. *NS 3.1 NS 3.2 NS 6.0 MR 1.2*	Use fact triangles to develop automaticity for multiplication facts.	**LIT** *Pigs Go to Market: Fun with Math and Shopping* by Amy Axelrod		P1 *Beat the Calculator Multiplication*: SMJ p286-7 **NS 1.3 NS 2.2**		Give a reasonable estimate.	TLG p848, "How did you solve No. 1?"
CA Project 11	**NS 3.3** Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory.	*Multiplication Fact Power* Multiplication fact practice.				Gather 9 pieces of chart paper; label each at the top with: *What Comes in Groups of . . .*, filling in the numbers 2-10. The space below will be for the lists students generate. Make 5 copies of journal (SMJ) p CA13 for each child; cut them in half so that each child has 10 pieces of paper. TLG p 942i		

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Flores, Canterbury, Fundanet, and Preston

**Grade 2
Page 24**

Unit 12: Year-End Review and Extensions		

Overview: To review time equivalencies and calendar facts, to read times in different ways and show time on a clock face; to show events on a timeline; to review and extend shortcuts and strategies for learning multiplication facts; to investigate the relationship between multiplication and division; and to read, draw, and interpret bar graphs and identify the range, median, and mode.

Big Ideas	**Number Relationships:** Addition and subtraction are inverse operations of each other and multiplication and division are inverse operations of each other. **Data:** Data can be collected, classified, analyzed & displayed using tables, charts & graphs.

	California Standards	Learning Target	Comments	Vocabulary	Games	Advanced Prep	RSAs	Writing/Reasoning Prompt – Math Boxes
12♦1	**MG 1.4** Tell time to the nearest quarter hour and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year). *NS 1.0*	Use a calendar and clock to describe relationships among units of time.	*For additional Literature Connections not connected to specific lessons, see the Unit Overview in the TLG*			For Math Message, MM p377, 1 per 4 students, cut apart. For Part 3 (EP) you will need the dates for the 1st day of summer vacation and the 1st day of next school year.	Describe the relationship between days in a week and hours in a day.	TLG p869, "Explain how you found the answer to No. 4."
12♦2	**MG 1.4** Tell time to the nearest quarter hour and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year). *NS 3.3 MG 1.5 MR 1.2*	Use and recognize alternate phrases to tell time.	Students may be able to tell time to the minute by this time (see comment for lesson 1♦3). The activity "Finding the Time Before and After a Given Time" is a bit of a stretch, but don't discount your students' abilities.				Record known addition and subtraction facts.	
12♦3	**SDAP 1.4** Ask and answer simple questions related to data representations. *MG 1.4*	Use a timeline to display events in sequential order.	For Part 2 "Making Clock Concentration Cards", include times to the minute	communicate, timeline, decade, century		For Part 1, prepare a timeline from 1830 to 2010, showing 10-year intervals.	Identify units of time.	
12♦4	**NS 3.3** Know the multiplication tables of 2s, 5s, and 10s (to "times 10") and commit them to memory. *NS 3.0 MR 1.2*	Use a variety of strategies to quickly compute basic multiplication facts.		Factor, product, turn-around rule	P2 *Name That Number*. MRB p138-9, MM p462 **NS 2.2 AF 1.3**		Use manipulatives and drawings to model multiplication.	TLG p888, "How did you find solutions to the three parts of No. 6?"
12♦5	**NS 3.0** Students model and solve simple problems involving multiplication and division. *NS 4.1 MR 1.2*	Use the inverse of multiplication on fact triangles to solve division problems (i.e. 3 X ? = 12).	Note typo: Some TLGs p 891 have 4 x 2 = 7 on blackboard graphic)		P2 *Addition Card Draw*: SMJ p300, MM p446 **NS 2.2**	Use MM p444 of Fact Triangle for teaching master from 11♦8.	Use arrays to model multiplication.	TLG p894, "How did you find the missing numbers in ___ - 23 = 17 and 60 - ___ = 28 in No. 6?"
12♦6	**SDAP 1.3** Identify features of data sets (range and mode). *NS 1.0 SDAP 1.2 SDAP 1.4 MR 3.0*	Answer questions about data represented on a bar graph.	**LIT** *If You Hopped Like a Frog* by David M. Schwartz **LIT** *The Tortoise and the Hare* by Janet Stevens **LIT** *Math Curse* by Jon Scieszka	median, range			Use a graph to draw conclusions.	
12♦7	**SDAP 1.3** Identify features of data sets (range and mode). *NS 3.3 SDAP 1.2 SDAP 1.4*	Represent and interpret data using tables, line plots and bar graphs.		mode	P2 *Addition Card Draw*: SMJ p300, MM p446 **NS 2.2**	For Math Message, prepare a number line, marked 0 to 10. Two sticky-notes per student.	Find the landmarks of a data set.	

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Flores, Canterbury, Fundanet,
and Preston

Grade 2
Page 25

Project 6	**NS 2.0** Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers. **MG 1.4** Tell time to the nearest quarter hour and know relationships of time (e.g., minutes in an hour, days in a month, weeks in a year). **SDAP 1.1** Record numerical data in systematic ways, keeping track of what has been counted.	*Time Capsule* Collect and display information included in the capsule.				Get the principal involved; have her/him come to class to receive the capsule.	

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Flores, Canterbury, Fundanet, and Preston

Grade 2
Page 26