



San Diego Unified School District

Instructional Module to Enhance the Teaching of

H A R C O U R T

Math

California Edition

Grade 1

Module 4–Revised

Addition and Subtraction to 12

-WORK IN PROGRESS -

Harcourt Math – Grade 1

**Module 4:
Addition and Subtraction to 12**

15 Days

Key Mathematical Concepts:

- Make the connection between models, equations, fact strategies and fact families
- Find sums and differences to 12
- Find the sum of three numbers
- Explore the Associative Property of Addition
- Solve comparative subtraction problems
- Understand how the elements of a subtraction problem are related
- Use addition to model subtraction as an inverse operation
- Identify and complete fact families
- Solve problems by using an appropriate strategy such as *write a number sentence, draw a picture, make a list*

<p>Chapter 12: Addition to 12 <u>DAY</u></p> <p>1 12.1 Count on to 12 2 12.2 Doubles and Doubles Plus 1 3 12.3 Add 3 Numbers 4 12.4 Problem Solving: Write a Number Sentence</p>	<p>Chapter 13: Subtraction to 12 <u>DAY</u></p> <p>5 13.1 Count Back 6 13.2 How Many More? 7 13.3 Related Addition and Subtraction Facts 8 13.4 Problem Solving: Draw a Picture</p>
<p>Chapter 14: Practice Addition and Subtraction <u>DAY</u></p> <p>9 14.1 Use Addition to Subtract 10 14.2 Fact Families 11 14.4 Problem Solving: Choose a Strategy 12 14.4 (Continued) Problem Solving: Choose a Strategy</p>	<p>Module 3 Assessment <u>DAY</u></p> <p>13 Independent Work Stations 14 Independent Work Stations 15 Independent Work Stations <u>NOTE: These three days may be used at any time during Module 3. Use them at a time you feel is the best opportunity to formally assess.</u></p>

Harcourt Math: Grade 1

Module 4:
Addition and Subtraction to 12

15 Days

Day 1 Unit 3 Lesson 12.1 Count on to 12	Day 2 Unit 3 Lesson 12.2 Doubles and Doubles Plus 1	Day 3 Unit 3 Lesson 12.3 Add 3 Numbers	Day 4 Unit 3 Lesson 12.4 Problem Solving: Write a Number Sentence	Day 5 Unit 3 Lesson 13.1 Count Back
Day 6 Unit 3 Lesson 13.2 How Many More?	Day 7 Unit 3 Lesson Addition and Subtraction Facts	Day 8 Unit 3 Lesson 13.4 Problem Solving: Draw a Picture	Day 9 Unit 3 Lesson 14.1 Use Addition to Subtract	Day 10 Unit 3 Lesson 14.2 Fact Families
Day 11 Unit 3 Lesson 14.4 Problem Solving: Choose a Strategy	Day 12 Unit 3 Lesson 14.4 Problem Solving: Choose a Strategy	Days 13, 14, 15 Unit 3 Assessment <u>NOTE: Days 13, 14, and 15 may be used at any time during Module 4. Use them at a time you feel is the best opportunity to formally assess.</u>		

San Diego City Schools
 Instruction and Curriculum Division
MATHEMATICS CURRICULUM MAP – GRADE 1

MODULE 4 – Addition and Subtraction to 12
Modules represent individual units of study that lead to essential learnings

<p>THREADS THROUGHOUT THE YEAR- FIRST GRADE <i>This represents what students should do throughout all modules (units of study). These items should not be isolated to a particular unit of study.</i> Students will:</p>
<p>Develop understanding of numbers and the number system and use their understanding to solve problems and recognize reasonable results.</p>
<p>Use mathematical reasoning to solve problems.</p>
<p>Develop understanding of and fluency in basic computation and procedural skills.</p>
<p>Use equations and to express generalizations of patterns and relationships.</p>
<p>Communicate their mathematical thinking by using words, numbers, symbols, graphs and charts., and describe different representations</p>
<p>Express generalizations of patterns and relationships.</p>
<p>Make connections among mathematical ideas and between other disciplines.</p>
<p>Develop and use strategies, skills, and concepts to solve problems.</p>
<p>Use appropriate tools, including technology as vehicles to learn mathematical concepts.</p>
<p>Essential learnings that represent bigger ideas/concepts *</p> <ul style="list-style-type: none"> • Students develop and use efficient strategies to solve problems for numbers less than 13. • Students utilize what they know about addition to think about and solve subtraction problems. • Students understand that subtraction can be used to compare two quantities or to show the difference between two quantities. • Students develop flexible ways of computation; they take apart and combine numbers in a wide variety of ways. • Essential learnings listed above will be developed by students over the course of the year
<p>Essential questions that will lead to the essential learnings</p> <p>How can I use what I know about addition to help me solve subtraction problems to 12?</p> <p>How can I use number relationships to find the sums and difference of number?</p> <p>How can I break numbers apart or combine numbers in flexible ways to solve addition and subtraction problems?</p> <p>How can I efficiently retrieve number facts to 12 for addition and subtraction?</p> <p>How can I compare two quantities for numbers less than 13 using subtraction?</p>
<p><i>Resources: Van de Walle, Chapter 10 pp. 135-140, Chapter 11, pp., 156 –165; K. Richardson, Hiding Assessment: Combination Trains, Ten Frames Mathematics Resource Book, pp. 14 -22</i></p>

DAY 1
Addition and Subtraction to 12
Chapter 12: Addition to 12
LESSON 12.1 TE pg.171A

LESSON FOCUS:	Count on to 12
CALIFORNIA STANDARD:	Number Sense 2.1 Know the addition facts (sums to 20) and the corresponding subtraction facts, and commit them to memory.
Purpose of Lesson:	To count one to 12 in order to find sums.
<p>ROUTINE TE pg.172 TE pg. 171A TE pg. 171A For each child, Number Lines (0-12) (p. TR34)</p>	<p>Suggestion: P.O.D.: TE, pg.171A <i>Continue to keep the Number Line and Hundred Chart visible to students to use as a tool for solving problems.</i> Or Getting Started: Vocabulary Development: TE, pg. 171A To encourage students to use the strategy of <i>counting on</i>, the following problems are rewritten in this section to reflect “<i>missing addend</i>” types, also known as “change unknown types”:</p> <ul style="list-style-type: none"> • Write on the board the math term <i>count on</i>. Give each child a copy of a Number Line • Review how to count on using $6 + \square = 8$. Using the Number line, have children place a finger on 6, then count on 2. Say 6, count on 7, 8. • Have children count on using their number lines to solve <p style="text-align: center;"> $7 + \square = 8$ $6 + \square = 9$ $5 + \square = 7$ $6 = 2 + \square$ * $9 + \square = 12$ </p> <p>* It is important for student to be exposed regularly to number sentences where the equal sign comes at the beginning of the equation. This helps them develop a more complete understanding equality.</p>
NOTE	<p>Some students may not be ready to understand the counting-on strategy or will have only a limited application of how/when to use it. According to Carpenter et. Al (1997), some students will still need to directly model the problem. There is no harm in showing a strategy that students may not be ready for; however, no student should be expected to use a strategy that does not make sense to them. Given enough opportunities, students will be able to move away from direct modeling to counting on as a more efficient strategy. Take note which students are unable to utilize this strategy. Additional opportunities will be necessary for these students.</p>

<p>LAUNCH TE pg. 125G For each pair, 40 counters (connecting cubes, pennies, paper clips, etc.), 2 number cubes or spinners (pg. TR104) numbered 1-6, scratch paper to record number sentences.</p>	<p>Introduce Activity: Practice Game: Toss and Write: TE, pg.125G</p> <p>Suggestion: (To modify game as a “Count On” activity)</p> <ol style="list-style-type: none"> 1. Both players begin with 20 counters in their “banks.” 2. Both players roll number cubes at the same time. 3. The player with the larger number places his number cube in front of him. He does not use counters to build the number. (To find the sum, the players must count on from this number cube only.) 4. The player with the smaller number counts out that many counters from his bank and passes them to the other player. 5. Together, they write a number sentence using the cube and counters to count on to find the sum. 6. The player who rolled the larger number keeps his partner’s counters. 7. The game ends when one player loses all of his counters. <p>Note: You may individualize the game by increasing or decreasing the numbers you write on the cubes or spinners</p>
<p>EXPLORE</p>	<p>Students work in pairs playing Toss and Write</p>
<p>PRACTICE TE and Workbook pg. 171-172</p>	<p>As time allows, TE and Workbook pg.171-172 Provide tools as appropriate. Students should not be <i>required</i> to use counting on as a strategy to solve the problems on these two pages. However, if counting on is the <i>only</i> strategy that you want the students to use, it is suggested that you make copies of worksheet that follows at the end of this lesson</p>
<p>SUMMARIZE</p>	<p>Revisit with students the lesson’s objective by connecting the following discussion to the purpose of the lesson. Discuss and Write: How would you solve $3 + \square = 10$ Why? Can anyone think of another way to solve this problem?</p>
<p>HOMEWORK</p>	<p>Suggestion: Family Involvement Activities pg. FA49-50</p>

DAY 2
Addition and Subtraction to 12
Chapter 12: Addition to 12
LESSON 12.2 TE pg.173A

LESSON FOCUS:	Doubles and Doubles Plus 1
CALIFORNIA STANDARD:	Number Sense 2.1 Know the addition facts (sums to 20) and the corresponding subtraction facts and commit them to memory.
Purpose of Lesson:	To add using doubles and doubles plus one.
ROUTINE TE pg.172 TE pg. 173A TE pg 173A, For each child, blank cards and crayons	Suggestion: Mixed Review and Test Prep: TE, pg. 172 Or P.O.D.: TE, pg.173A Or Getting Started: Vocabulary Development: TE, pg. 173A Ask: <i>Is a double odd or even? How do you know? Is a double + 1 odd or even? How do you know?</i> Definition of an even number is "2n or a double." Definition of an odd number is a double plus 1 (2n + 1).
LAUNCH For each student, dot cards 2-8 (pg.TR21-22) and 4 blank cards.	Introduce Activity: <ul style="list-style-type: none"> • Pass out dot cards 2-8 (TR21-22) to each student. Ask students to write either <i>double</i> or <i>double plus one</i> on each card. • Pass out 4 blank cards to each student and ask students to create dot cards for 9, 10, 11, and 12. When they have finished ask them to write either the doubles fact or doubles plus one fact on the back of each card. For example: On Card #2, students will write the word <i>double</i> on the front and 1+1 on the back. Card #5, students will write <i>doubles + one</i> on the front, and either 2+2+1 or 2+3 or 4+1 on the back. Card #8, students write <i>double</i> on the front and 4+4 on the back, etc.
EXPLORE	<ul style="list-style-type: none"> • Students work independently or in pairs creating cards. As students work, Ask: <i>"What clues are you using to figure out if the card shows a double or a double s plus one? Did anyone figure it out in a different way? How did you figure out which fact to write on the back? Did anyone think about it another way?"</i>
PRACTICE TE and Workbook, pg.173-174	As time allows: TE and Workbook, pg. 173-174 Provide tools as appropriate.
SUMMARIZE	Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson. Discuss and Write: <i>What strategies would you use to find the answer to 3+4? Would anyone else use a different strategy? Why?</i>
HOMEWORK	Suggestion: Practice Master 12.2, Or Pgs. 173-174.

DAY 3:
Addition and Subtraction to 12
Chapter 12: Addition to 12
LESSON 12.3 TE pg.175A

LESSON FOCUS:	Add 3 Numbers
CALIFORNIA STANDARD:	Number Sense 2.7 Find the sum of three one-digit numbers.
Purpose of Lesson:	To find the sum of three numbers and to explore the associative property of addition.
ROUTINE TE pg.175 TE pg.175A, For partners, 27 connecting cubes (9 each of 3 colors)	Suggestion: Quick Review: TE, pg. 175 Or P.O.D.: Ask: "How many ways can you model 12?" Or Getting Started: Model 3 Addends: TE, pg. 175A
LAUNCH For each student, blank paper, crayons, counters if necessary	Introduce Small Group Activity: <ul style="list-style-type: none"> • Each student writes a number story about 3 groups of an item being added together. • For example: <i>Sponge Bob Squarepants</i> <i>Has 3 pet jellyfish, 1 pet snail and 2 pet rocks.</i> <i>How many pets does Sponge Bob have?</i> • Students draw a picture and write a number sentence to solve their own story. Students who need further support may use counters. • Put students into groups of three or four. Students pass their stories around the group. Each group member reads the story, looks at the addition sentence(s) already written and writes the addition sentence in a different order. Challenge: <ul style="list-style-type: none"> • Groups work together to try to figure out how many different ways there are to write an addition sentence using the same three addends when the order of the addends is changed. (6) <i>Does changing the order change the sum? Can we change the order in subtraction? Why or why not?</i>
EXPLORE	Students work on Number Stories with Three Addends.
PRACTICE TE and Workbook pg. 175-176	As time allows: TE and Workbook pg. 175-176

SUMMARIZE	Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson. Discuss strategies students used to find different ways to write the number sentences in their groups. Ask: <i>How would you find the sum of $2+5+3$? Would anyone do it a different way? When the order is different, does that mean the sum is also different? Why not?</i>
HOMEWORK	Suggestion: Family Involvement Activities pg. FA51, Or TE and Workbook, pg. 175-176.

DAY 4
Addition and Subtraction to 12
Chapter 12: Addition to 12
LESSON 12.4 TE pg. 177A

LESSON FOCUS:	Problem Solving: Write a Number Sentence
CALIFORNIA STANDARD:	Algebra and Functions 1.0 Students use number sentences with operational symbols and expressions to solve problems.
Purpose of Lesson:	To solve addition story problems by writing a number sentence, a problem solving strategy.
ROUTINE TE pg. 177A TE pg. 178 (bottom margin), Anthology pg. AN 9	Suggestion: Getting Started: Vocabulary Development: TE, pg. 177A And/Or Literature Connection: TE, pg.178 <ul style="list-style-type: none"> • Read the story asking students to create mental images as they listen. • Discuss the story and ask students to describe their mental images. • Reread the story this time asking students to use their mental images to try to figure out how many animals and people it took to pull up the enormous turnip. • Ask students to describe how they organized their mental images to help them count or keep track.
LAUNCH TE and Workbook pg. 177-178	<ul style="list-style-type: none"> • Follow instructions under Teach: Guided Instruction, TE pg. 177. • Students complete Workbook pg. 177. • Next, Instruct students to complete “Practice” Workbook pg. 178. However, ask them to solve only the problems whose sums are odd.
EXPLORE	<ul style="list-style-type: none"> • Students work on pg.178. Ask: “<i>What strategy are you using to figure out which problems to do?</i>” <i>Is anyone using a different strategy?</i>”
PRACTICE	As time allows , Choose an appropriate Blackline Master from the bottom margin on TE pg. 177-178.
SUMMARIZE TE and Workbook pg. 178	Revisit with students the lesson’s objective by connecting the following discussion to the purpose of the lesson. Write About It: TE and Workbook pg. 178. Think, Pair, Share. <ul style="list-style-type: none"> • Give students quiet time to think about a story to go with the picture. • Then ask students to share their stories with a partner. • Finally ask for volunteers to share stories with the class. As students share, write corresponding number sentences on the board.
HOMEWORK	Suggestion: <u>Family Involvement Activities</u> pg. FA52 Planning Ahead: <u>On Day 7 of Module 4, each student will need at least 6 pennies for a partner activity in lesson 13.3.</u>

DAY 5
Addition and Subtraction to 12
Chapter 13: Subtraction to 12
LESSON 13.1 TE pg. 183A

Note: The strategy of counting back is introduced in this lesson. Counting back can be an effective way to subtract small numbers. However it is not as efficient when the subtrahend is larger than 3. It is far easier for child to count up from 4 when solving $9 - 4 = ?$. Many students will want to connect what they know about addition to solve these problems. Recently published research (Kamii & Lewis, 2003) suggests that students who do not know sums solidly, will not be able to subtract with fluency. Again, it must be emphasized that no child should be expected to use a strategy that doesn't make sense to him/her. Counting back may prove to be difficult and problematic.

LESSON FOCUS:	Count back
CALIFORNIA STANDARD:	Number Sense 2.1 Know the addition facts (sums to 20) and the corresponding subtraction facts and commit them to memory.
Purpose of Lesson:	To count back 1, 2, and 3 to find differences.
ROUTINE TE pg. 184 TE pg. 183A, For partners, 2 different-color counters, Number Lines (p. TR34)	Suggestion: Mixed Review and Test Prep: TE, pg. 184 Or P.O.D.: What are some number sentences for 20? Or Getting Started: Modeling Counting Back: TE, pg. 183A
LAUNCH For teacher, scissors, yarn, poster board into strips. For partners, glue, markers, 1 connecting cube. For partners, Subtraction Fact Cards (pp. TR49-50).	Introduce Activity: Choose either Alternative Teaching Strategy TE, pg.184A. <i>Make a Kinesthetic Number Line</i> Or Advanced Learners TE, pg.184A <i>Count Back Mentally To Find Differences.</i> Students can practice using the <i>Challenge 13.1</i> worksheet.
EXPLORE	Students work in pairs on either activity.
PRACTICE TE and Workbook, 183-184	As time allows, TE and Workbook, 183-184 (Student may choose to use the number lines provided on the page or may use any method that makes sense to them to solve these problems).

SUMMARIZE	<p>Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson.</p> <p>Discuss: Give students a subtraction problem orally, such as $12-2= \square$.</p> <ul style="list-style-type: none">• Ask students to share with a partner how they solved the problem.• Then ask for a volunteer to share his or her strategy. Ask, <i>"Did anyone think about it another way?"</i> Continue with more problems such as 10-3, 9-1, 6-3, etc. each time asking students to share their strategy. <p>Write: As time allows, ask students to choose a subtraction sentence to write in their math journal and use words or pictures to explain how they solved the problem.</p>
HOMEWORK	<p>Suggestion: <u>Family Involvement Activities</u> pg. FA53, Or Practice Master 13.1, Or TE and Workbook, pgs. 183-184.</p>

DAY 6:
Addition and Subtraction to 12
Chapter 13: Subtraction to 12
LESSON 13.2 TE pg. 185A

LESSON FOCUS:	How Many More?
CALIFORNIA STANDARD:	Number Sense 2.5 Show the meaning of addition (putting together, increasing) and subtraction (taking away, comparing, finding the difference).
Purpose of Lesson:	To solve comparative subtraction problems.
ROUTINE For partners, 24 connecting cubes (12 each of 2 different colors). For teacher, poster board, markers (2 colors).	Suggestion: Quick Review: TE, pg. 185 Or P.O.D.: TE, pg.185A Or Getting Started: Modeling How Many More: TE, pg. 185A (Use connecting cubes instead of 2-color counters for this activity because this is what the students will be using for their EXPLORE activity.)
LAUNCH For partners, 24 connecting cubes (12 each of 2 different colors), Numeral Cards 1-12 (pp. TR36-37).	Introduce Activity: Alternative Teaching Strategy: TE, pg. 186A <i>Comparing Unequal Groups</i> Increase or decrease amount of counters based on students' instructional levels.
EXPLORE	Students work in pairs on <i>Comparing Unequal Groups</i> .
PRACTICE TE and Workbook, pg. 185-186	As time allows, TE and Workbook, pg. 185-186
SUMMARIZE	Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson. Discuss and Write: TE, pg. 186
HOMEWORK	Suggestion: <u>Family Involvement Activities:</u> FA54 and 57, or TE and Workbook, pgs. 185-186. <u>Each student will need at least 6 pennies each for an activity tomorrow.</u>

DAY 7:
Addition and Subtraction to 12
Chapter 13: Subtraction to 12
LESSON 13.3 TE pg. 187A

LESSON FOCUS:	Related Addition and Subtraction Facts
CALIFORNIA STANDARD:	Number Sense 2.1 Know the addition facts (sums to 20) and the corresponding subtraction facts and commit them to memory.
Purpose of Lesson:	To understand how the elements of a subtraction problem are related.
ROUTINE	Suggestion: Alternative Teaching Strategy: TE pg. 188A Or P.O.D. TE, pg.187A
LAUNCH For partners, 1 cup, 12 pennies, paper.	Introduce Activity: Daily Routine TE, pg. 187A Increase or decrease pennies based on instructional levels.
EXPLORE	Students work in pairs writing related addition and subtraction facts as they spill pennies.
PRACTICE TE and Workbook 187-188	As time allows, TE and Workbook, pg. 187-188
SUMMARIZE	Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson. Discuss and Write: $8+4=12$ $12-4=8$ How are these two facts alike? Different? How are these facts related? Challenge: Can you think of any other number sentences that are related to these? ($4+8=12$ and $12-8=4$).
HOMEWORK	Suggestion: <u>Family Involvement Activities:</u> FA55, or TE and Workbook, pgs. 187-188.

