San Diego Unified School District

Instructional Module to Enhance the Teaching of

HARCOURT

Math

California Edition

Grade 1

Module 9–Revised

Addition and Subtraction

-WORK IN PROGRESS –

Revised 11/3/04

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

MODULE 9 – ADDITION AND SUBTRACTION

Modules represent individual units of study that lead to essential learnings

THREADS THROUGHOUT THE YEAR:

The threads represent ongoing learning opportunities in which students should be actively engaged throughout all units of inquiry during the entire school year. These items should not be isolated to any one particular unit of inquiry.

Students will be provided opportunities to:

- Develop understanding of numbers and the number system and use their understanding to solve problems and recognize reasonable results.
- Use mathematical reasoning to solve problems.
- Develop understanding of and fluency in basic computation and procedural skills.
- Use equations and to express generalizations of patterns and relationships.
- Communicate their mathematical thinking by using words, numbers, symbols, graphs and charts., and describe different representations
- Express generalizations of patterns and relationships.
- Make connections among mathematical ideas and between other disciplines.
- Develop and use strategies, skills, and concepts to solve problems.
- Use appropriate tools, including technology as vehicles to learn mathematical concepts.

These are essential learnings that represent bigger ideas/concepts:

- Students understand that numbers are related to each other in a wide variety of relationships.
- Students understand that number relationships can be used to find efficient strategies to solve problems for numbers to 20 and to retrieve facts.
- Students use their knowledge of the parts of numbers to 10 to add/subtract from numbers up to 20.
- Students combine numbers by reorganizing them into a 10 and leftovers.
- Students subtract quantities by breaking numbers apart, subtracting, and recombining whatever is left to find the answer.
- Students utilize what they know about addition to think about and solve subtraction problems.
- Students understand relationships among the operations of addition and subtraction.
- Students write and solve sentences from problem situations that express relationships involving addition and subtraction.

These are essential questions that learners ask themselves in order to achieve the essential learnings:

- What strategies can I use to find sums and differences for two numbers up to 20?
- How can I use the "make-a-ten" strategy to assist in adding or subtracting?
- How can I add three numbers in an efficient way?
- How can I use what I know about addition to help me with subtraction?
- How can I use number relationships to help retrieve math facts?
- How does a ten frame help me to solve addition problems?
- How can I express relationships involving addition and subtractions by writing number sentences?

Resources: **Van de Walle, Chapter 10, pp. 135 –143; Chapter 11 , pp.,156 –167; K. Richardson, *Combination Trains, Ten Frames; Mathematics Source Book*, pp. 14 –26**

Harcourt Math: Grade 1

Module 9: Addition and Subtraction to 20

20 Days

Day 1 Unit 6 Lesson 26.1	**Day 2** Unit 6 Lesson 26.2	**Day 3** Unit 6 Lesson 26.3	**Day 4** Unit 6 Lesson 26.4	**Day 5** Unit 6 Lesson 26.5
Day 6 Unit 6 Lesson 26.6	**Day 7** Unit 6 Lesson 27.1	**Day 8** Unit 6 Lesson 27.2	**Day 9** Unit 6 Lesson 27.3	**Day 10** Unit 6 Lesson 27.4
Day 11 Unit 6 Lesson 28.1	**Day 12** Unit 6 Lesson 28.2	**Day 13** Unit 6 Lesson 28.3	**Day 14** Unit 6 Lesson 28.4	**Day 15** Unit 6 Chapters 26, 27, and 28 Practice/ Assessment*
Day 16 Unit 6 Chapters 26, 27, and 28 Practice/ Assessment*	**Day 17** Unit 6 Chapters 26, 27, and 28 Practice/ Assessment*	**Day 18** Unit 6 Chapters 26, 27, and 28 Practice/ Assessment*	**Day 19** Unit 6 Chapters 26, 27, and 28 Practice/ Assessment*	**Day 20** Unit 6 Chapters 26, 27, and 28 Practice/ Assessment*

***NOTE:** Six additional days are provided in Module 9 for practice and assessment. Use them at any time during Module 9 where you see the greatest need for additional practice time, or when formal assessment will be the most valuable.

Routines that emphasize number relationships (e.g., one more/one less, two more/ two less) are helpful to reinforce the concepts covered in this modules. Continue to adjust the selection of routines that support the needs of students in your class.

Harcourt Math – Grade 1
Module 9: Addition and Subtraction to 20

20 days

Key Mathematical Concepts:

- Find sums and differences to 20
- To write sums to 20 using various strategies such as *doubles, doubles plus one, and make ten*
- To use the Associative Property to find the sum of three numbers to 20
- To write differences from 20 by using various strategies such as *counting back and think addition to subtract*
- Use addition to model subtraction as an inverse operation
- To write and solve related addition and subtraction sentences by using the inverse relationship between addition and subtraction (fact families)
- Identify and complete fact families
- Solve problems by using an appropriate strategy

Big Ideas to consider about while teaching this

Students need to be able to see number relationships in order to help them remember basic facts

- There are patterns and relationships in basic facts. You can figure out new or unknown facts from the ones you already know
- All the facts can be learned with the help of efficient strategies
- The more solid children's knowledge of a sum, the easier it is for them to produce the difference

(adapted from Van der Walle, 2001;Kamii, 2004)

This module has students developing, understanding and acquiring strategies for addition and subtraction facts through 20. However, we do not teach strategies, rather, we teach ***for*** strategies to occur by providing opportunities for students. Van de Walle states:" No child should be expected to utilize a strategy without understanding it".

Chapter 26: Addition Facts and Strategies to 20		**Chapter 27: Subtraction Facts and Strategies**	
DAY		DAY	
1	26.1 Doubles and Doubles Plus 1	**7**	27.1 Count Back 1,2, and 3
2	26.2 10 and More	**8**	27.1 Doubles Fact Families
3	26.3 Make 10 and Add with 9	**9**	27.3 Think Addition to Subtract
4	26.4 Make 10 to Add with 6,7, and 8	**10**	27.4 Problem Solving: Choose the Operation
5	26.5 Add 3 Numbers		
6	26.6 Problem Solving: Too Much Information		

Chapter 28: Addition and Subtraction Practice	**Module 9 Practice and Assessment***
DAY	DAY
11 28.1 Practice Sums and Differences	**15** Practice/Assessment
12 28.2 Practice Sums and Differences	**16** Practice/Assessment
13 28.3 Practice Sums and Differences	**17** Practice/Assessment
14 28.4 Problem Solving: Make a Table	**18** Practice/Assessment
	19 Practice/Assessment
	20 Practice/Assessment
	These six days can be used at any time during the 20 day period of Module 9.

***NOTE:** Six additional days are provided in Module 9 for practice and assessment. Use them at any time during Module 9 where you see the greatest need for additional practice time, or when formal assessment will be the most valuable.

If you observe a particular *Explore* activity that is valuable practice for your students, gather materials to make it an independent learning station for further practice.

DAY 1
Unit 6: Addition and Subtraction to 20
LESSON 26.1 TE P. 373A

Note: "*Strategy selection* or *strategy retrieval* is the process of deciding what strategy is important. Students need to know not only how to use the strategy but also how to select the appropriate strategy when it is needed." (Van der Walle, 2001)

Students can become quite adept at using the strategy of doubles and doubles plus one, *when their practice on a worksheet includes only that strategy.* However, when presented with a mixture of facts, for example 7+6 3+9 8+5, they might not know which strategy to use for which fact. There is no mind set or reminder to use different processes for each because *when they were practicing, there was no need to know which strategy might be useful.* Can the students identify the doubles and doubles plus one strategy in a list of addition problems where some of the problems are not doubles or doubles plus one? As students move through this module and develop their understanding of acquiring strategies, provide opportunities to identify a particular strategy amid list of mixed facts.

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:	Understand how the doubles and doubles plus one strategies can assist to find sums to 20.
ROUTINE: *TE and Workbook P. 371* *Hundred Chart* *TE P.373A*	Suggestion: **Introducing the Chapter: TE P. 371** Or **Hundred Chart Activity:** • Pose a variety of doubles problems orally to students. "2+2 is ? 7+7 is ?" etc. • As you call on students to answer the questions, ask them to come to the hundred chart and flip the number card representing the sum. • When you have said all of the doubles from 1+1 to 10+10, ask students to discuss the patterns they see. Every other number is the sum of a double, they are all even numbers, 2,4,6,8,0, keeps repeating in the ones place... Or **P.O.D.: TE P. 373A** Continue to keep the Number Line and Hundred Chart visible to students to use as a tool for solving problems. **Continue questioning each day:** • How did you think about the problem to come up with that answer? • Did anyone think about it another way? • Explain how you got your answer.

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LAUNCH: *TE and Workbook P. 373. For each pair, 20 counters.*	**Introduce Activity:** See **Teach: Guided Instruction TE P. 373** • Line up 8 yellow and 8 red counters to model 8 + 8. Ask children to count the counters to find the sum. Discuss that 8 +9 is 1 more than 8 + 8. Add 1 more red counter. Children add 1 to 16 to find the sum. • Ask students to work in pairs completing exercises 1-9. After each problem, students take turns using counters and/or words to show how the doubles fact helps to know the doubles plus one fact.
EXPLORE: *For each student, Addition Facts Table (Teacher Resource Book P. TR15). For the teacher, an overhead transparency of the table.*	• When students complete workbook P. 373, show them an overhead of the addition facts table (Teacher Resource Book P. TR15). • Demonstrate how to use the rows and columns to find sums. • Ask them to work with a partner to write the sums of the doubles in problems 1-9. • Ask students to look for patterns and discuss them with their partners. • *Ask, "What patterns do you notice?" "Did anyone see another pattern?" Then ask them to write the sums to the doubles plus one facts in problems 1-9.* • Again, look for patterns and discuss. Students may use the patterns they discover to find out which doubles and doubles plus one sums are missing from the table and fill them in.
PRACTICE:	**Students work in pairs completing Workbook P 373** and discussing number relationships. Students work in pairs finding patterns in doubles and doubles plus one sums in the addition facts table. ***Note: Save each student's addition facts table for future use.***
SUMMARIZE:	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 6+7?* • *Can anyone think of another way to solve this problem?* • *How would you solve 5+6? Draw or write about your strategy in your journal and share your work with a partner.* (Note: It is possible that a student may use a strategy that is not the same as you emphasized in class. Regardless, the strategy should be developed using number relationships that they have constructed on.)
HOMEWORK:	**Suggestion:** Family Involvement Activities pp. FA113-114

DAY 2
Unit 6: Addition and Subtraction to 20
LESSON 26.2 TE P. 375A

Math Background: This lesson provides children with experiences in adding 10 and a number less than 10. By using a ten frame, children can easily visualize the 2-digit sum. Children can quickly see the pattern that results when a 1-digit number is added to 10.

LESSON FOCUS:	**10 and More**
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 a ten frame can assist in learning to add ten and numbers less than 10.
ROUTINE: *TE P. 375A* *TE P. 375A*	**Suggestion:** **Calendar Math: TE P. 375A** Or **P.O.D.: TE P. 375A** • Continue to keep the Number Line and Hundred Chart visible to students to use as a tool for solving problems. **Continue questioning each day:** • *How did you think about the problem to come up with that answer?* • *Did anyone think about it another way?* • *Do you agree or disagree with this response?* • *What was your strategy?* • *Explain how you got your answer.*
LAUNCH: *TE P. 375A* *For each pair, Ten Frames Worksheet (Teacher Resource Book p.TR63),paper lunch bag, 19 counters – 10 for ten frame, nine for paper bag. (If you don't have enough 2-color counters, use pennies, buttons, etc.), scratch paper.*	First model using a ten frame, see **Model Finding the Sum of 10 and Another Number, TE P. 375A.** **Introduce Activity:** "Ten Plus a Handful" • Students keep one of the two Ten Frames full as the representation of 10. • Partner A reaches into the paper bag and pulls out a handful of counters. • Partner A places the counters into the empty Ten Frame. (**NOTE:** Remind students that the protocol for filling a Ten Frame is to start at the top left, filling across the row from left to the right) Partner B writes the number sentence on scratch paper (10 + 5 = 15). • Return counters to bag. Players switch roles. Ask students to look for number patterns in their equations as they work and discuss them. ***Note: Save Ten Frame Worksheets for future use. (These could also be used for a routine)***

EXPLORE: *Addition Facts Table from Day 1.*	• Students work in pairs finding sums to 10 plus more problems. • When students seem to have solved most of the problems from 10+1 through 10+9, instruct them to write these sums on their addition facts table. • Ask them to discuss the patterns they notice with their partner. Fill in any missing sums.
PRACTICE: *TE and Workbook Pp. 375-376*	**As time allows, TE and Workbook pp. 375-376**
SUMMARIZE: *For the teacher, overhead of addition facts table from Day 1.*	Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson. **Discuss:** • **Ask,** *"What number patterns did you notice when you wrote your number sentences for 10 plus some more?"* • Look for responses such as, *"Whatever number we added to ten, the sum ended in that number. The first digit in all of the sums was 1 The sum was almost always a teen."* • Use overhead transparency of the addition facts table to discuss the patterns students noticed in 10 plus more problems.
HOMEWORK:	**Suggestion:** Practice 26.2 See bottom margin TE P.375

DAY 3
Addition and Subtraction to 20
LESSON 26.3 TE P. 377A

MATH BACKGROUND: This lesson introduces children to a strategy for adding a number to nine. Children are asked to create a ten in order to find the sum. Children often have difficulty adding nine and another number. This method can help children by making the problem into another one that is easier to solve. Use the ten frame at first as children are learning this technique. Encourage children who master this quickly to make a ten mentally.

(For students to use this strategy effectively, children will have had to learn to think of the numbers 11 to 19 as 10 and some more.) This is a challenging concept for many first graders.

LESSON FOCUS:	**Make 10 to Add with 9**
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 make-a-ten strategy can assist to find sums of 9 plus other numbers.
ROUTINE: *TE P. 377A* *TE P. 378*	**Suggestion:** **P.O.D.: TE P. 375A** Or **Mixed Review and Test Prep: TE P. 378** • Continue to keep the Number Line and Hundred Chart visible to students to use as a tool for solving problems. **Continue questioning each day:** • *How did you think about the problem to come up with that answer?* • *Did anyone think about it another way?* • *Do you agree or disagree with this response?* • *What was your strategy?* • *Explain how you got your answer.*
LAUNCH: *TE P. 377A* *For each pair, Ten Frames Worksheet from Day 2, paper lunch bag, 18 counters – 9 for Ten Frame, 9 for paper bag, scratch paper.*	First model the make-a-ten strategy, see **9 and More, TE P. 377A.** **Introduce Activity:** "Nine Plus a Handful" • Students keep one of the two Ten Frames full of nine counters as the representation of 9. • Partner A reaches into the paper bag and pulls out a handful of counters. (If students are not using 2-color counters, the counters in the bag must be different than the 9 counters on the ten frame so that the 9 plus some more is clearly visible.) • Partner A places the counters into the empty Ten Frame, then moves one of the counters to the top ten frame to "make-a-ten." Partners figure the sum.

	• Partner B writes the number sentence on scratch paper (9 + 5 = 14). • Return counters to bag. Players switch roles. • Ask students to look for number patterns in their equations as they work and discuss them.
EXPLORE:	Students explore "Nine Plus A Handful."
PRACTICE:	• Students work in pairs finding sums to 9 plus more problems. • When students seem to have solved most of the problems from 9+1 through 9+9, instruct them to write these sums on their addition facts table. • Ask them to discuss the patterns they notice with their partner. Fill in any missing sums. (**What to note:** Does the student use the ten frame? Do they count out each number separately and then need to count how many in all? Do they demonstrate a knowledge of what they know about 10 to help them or do they seem to fill up the ten frame by rote, without constructing number relationships? Can they explain their thinking?)
SUMMARIZE: *For the teacher, overhead of addition facts table from Day 1.*	*Revisit with students the lesson's objective by connecting the following discussion to the purpose of the lesson.* **Discuss:** • **Ask**, "*What number patterns did you notice when you wrote your number sentences for 9 plus some more?*" • Look for responses such as, "*Whatever number we added to ten, the sum ended in a number one less than that number. The first number in all of the sums was 1.*" • **Ask**, "*How can the Make-a-Ten strategy help to solve 9+4?*" • Look for responses such as, "*When you see 9 plus 4, you can take one away from 4 and make the nine a ten and think of the problem as 10 +3.*" • Use overhead transparency of the addition facts table to discuss the patterns students noticed in 9 plus more problems. • **Ask**, "*How is this pattern different from what you noticed about the 10 plus more problems? How are the patterns the same?*" • Show 4+4 5+6 and 9+4 and ask which strategy would be used to find the answer for each.
HOMEWORK:	**Suggestion:** Workbook Pp. 377-378

DAY 4
Unit 6: Addition and Subtraction to 20
LESSON 26.4 TE P. 379A

LESSON FOCUS:	**Make 10 to Add with 6, 7, and 8**
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 make-a-ten strategy assists to find sums of 9 plus other numbers.
ROUTINE: *TE P. 380*	**Suggestion:** **P.O.D., TE 379A** • *Tim collected 7 brown shells and 5 white shells. How many shells did Tim collect?* • After students offer their own strategies for solving this problem, if no one has used the Make-a-Ten strategy, then ask, "How might we use the Make-a-Ten strategy for this problem?" Or **Mixed Review and Test Prep: TE P.380** • Continue to keep the Number Line and Hundred Chart visible to students to use as a tool for solving problems. **Continue questioning each day:** • *How did you think about the problem to come up with that answer?* • *What was your strategy?* • *Explain how you got your answer.*
LAUNCH: *TE P. 380* *For each student, blank paper*	**Introduce Activity: Problem Solving – Reasoning, TE and Workbook P. 380** • *Josh wants to plant 15 seeds. Right now, he has only 8 seeds. How many more seeds does he need? (* This type of problem, will be very difficult for students who must still model the action of the problem directly because there is no inherent action stated in the problem. • Many students will begin this problem by drawing or counting out 15 objects and adding 8 more to it. Though the emphasis is on showing students that making a ten is useful strategy, some students will have not yet made sense of the strategy and probably not see the relationships. If this problem is too difficult adjust the numbers) • Provide students with a blank piece of paper so they have sufficient room to show their thinking. • Remind students they may use counters, pictures, ten frames, numbers and words to solve the problem and show their thinking.
EXPLORE:	• Students work individually or in small groups solving the problem and recording their strategy.