



San Diego Unified School District

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**Instructional Module to Enhance the Teaching of**

**HARCOURT**

**Math**

**California Edition**

**Grade 2**

**Module 4 - Revised**

**2-Digit Addition and  
Subtraction**

– WORK IN PROGRESS –

# Harcourt Math – Grade 2

## MODULE 4

### 2-Digit Addition

16 Days

#### Key Mathematical Concepts:

- Count on
- Add tens
- Add one and two digit numbers
- Estimate sums
- Use mental math
- Solve a problem by using an appropriate strategy

<p><b>Chapter 11 Explore Two-Digit Addition</b></p> <p>Lesson 11.1: Add Tens Lesson 11.2: Count on and Tens and Ones Lesson 11.3: Adding One to Two-Digit Numbers Lesson 11.4: Two-Digit Addition Lesson 11.5: Problem Solving: Make a Model</p>	<p><b>Chapter 12 Two-Digit Addition</b></p> <p>Lesson 12.1: Add Two-Digit Numbers Lesson 12.2: More Two-Digit Addition Lesson 12.3: Vertical and Horizontal Problems Lesson 12.4: Problem Solving: Estimate Sums</p>
<p><b>Chapter 13 Practice Two-Digit Addition</b></p> <p>Lesson 13.1: More Two-Digit Addition Lesson 13.2: Using Mental Math to Find Sums Lesson 13.3: Adding Two-Digit Numbers Lesson 13.4: Problem Solving: Make and Use a Graph Lesson 13.5: Problem Solving Lesson 13.6: Problem Solving</p>	<p><b>Chapter 13 Practice Two-Digit Addition</b></p> <p>Assessment</p>

<p><b>Day 1</b> Unit 11 Lesson 11.1</p>	<p><b>Day 2</b> Unit 11 Lesson 11.2</p>	<p><b>Day 3</b> Unit 11 Lesson 11.3</p>	<p><b>Day 4</b> Unit 11 Lesson 11.4</p>	<p><b>Day 5</b> Unit 11 Lesson 11.5</p>
<p><b>Day 6</b> Unit 12 Lesson 12.1</p>	<p><b>Day 7</b> Unit 12 Lesson 12.2</p>	<p><b>Day 8</b> Unit 12 Lesson 12.3</p>	<p><b>Day 9</b> Unit 12 Lesson 12.4</p>	<p><b>Day 10</b> Unit 13 Lesson 13.1</p>
<p><b>Day 11</b> Unit 13 Lesson 13.2</p>	<p><b>Day 12</b> Unit 13 Lesson 13.3</p>	<p><b>Day 13</b> Unit 13 Lesson 13.4</p>	<p><b>Day 14</b> Unit 13 Lesson 13.5</p>	<p><b>Day 15</b> Unit 13 Lesson 13.6</p>
<p><b>Day 16</b> Unit 13 Assessment</p>				

**MODULE 4 – TWO DIGIT 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 of study.*

Students will:

- Develop understanding of numbers and the number system and use their understanding to solve problems and recognize reasonable results.
- Develop understanding of and fluency in basic computation and procedural skills.
- Use mathematical reasoning to solve problems.
- Communicate their mathematical thinking by using words, numbers, symbols, graphs and charts.
- Express generalizations of patterns and relationships.
- Develop logical thinking to analyze evidence and build arguments to support or refute a hypothesis.
- 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 estimate, calculate, and solve problems involving addition and subtraction of two-digit numbers.
- Students use what they know about numbers as tens and ones to add and subtract two-digit numbers.
- Students develop flexible ways of computation involving taking apart and combining numbers in a wide variety of ways for finding sums and differences.
- Students combine numbers for addition by reorganizing them into a 10 and ones.
- Students subtract quantities by breaking numbers apart, subtracting, and recombining whatever is left to find the answer

\* Essential learnings listed above will be developed by students over the course of the year.

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

- *How can I use what I know about tens and ones to add and subtract two-digit numbers?\**
- How do I estimate the sums or differences of two-digit numbers?
- *How can I use place value to decompose numbers to find sums or differences?\**
- What strategies do I use to find the sums or differences\* of two whole numbers up to two digits long?

\*Presented in previous grades.

**Resources:** Van de Walle, Chapter 10, pp.,135 -142, Chapter 12 ,p. 178 –182, Chapter 13, 201-214, K. Richardson Two-Digit Addition and Subtraction, *Mathematics Source Book*, pp 14-26



<b>PRACTICE</b>	<b>As time allows:</b> pages 157 and/or 158
<b>SUMMARIZE</b>	<b>Closure:</b> <ul style="list-style-type: none"><li>• Revisit purpose of the lesson with students.</li><li>• See ASSESS, TE, P. 158: <i>How does knowing <math>3 + 4</math> help you solve <math>3 \text{ tens} + 4 \text{ tens}</math>?</i></li></ul>
<b>HOMEWORK</b> <b>Materials:</b> <ul style="list-style-type: none"><li>• 100 chart (P. TR 33)</li><li>• index cards/slips of paper</li></ul>	<b>Suggestion:</b> See Alternative Teaching Strategy, TE, page 158A. Students make problems for themselves on index cards/slips of paper. They use the 100 chart to solve problems. Students write about how they used the chart. Students may: <ul style="list-style-type: none"><li>• Count out the first number by bones and count on the second number by ones.</li><li>• Start with a number and count on the second number by ones or tens.</li><li>• Start with the highest number and count on by ones or tens</li></ul>

Ones/Tens Relationships

Knowing...	Helps me to know...

DAY 2:  
Chapter 11: Explore Two-Digit Addition  
LESSON 11.2  
TE P. 159A

<b>LESSON FOCUS:</b>	<b>Count on Tens and Ones</b>
<b>CALIFORNIA STANDARD:</b>	<b>Number Sense: 2.0</b> Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers.
<b>Purpose of Lesson:</b>	<b>Understand how to count on by tens and ones to a two-digit number.</b>
<b>Routine</b>  <b>Materials:</b> • base ten materials (a variety, including commercially available materials, bundles of sticks, beans and cups, and snap cubes)	<b>Suggestion: Solving Problems</b> <ul style="list-style-type: none"> <li>• Give students a problem to solve:  <i>Ms. Smith sent 17 students out to the playground.</i>  <i>Mr. Brown sent 18 students out to the playground.</i>  <i>How many students are out on the playground?</i></li> <li>• To ensure that students understand what is happening in the problem, ask volunteers to retell the story problem.</li> <li>• Discuss: what are ways that you could solve this problem? Ask students to solve the problem using tools and strategies they understand. Make manipulatives available. Ask students to share their methods for solving the problem with the whole class.</li> <li>• Chart students' strategies. Discuss how to represent the problem in an equation. Record the equation horizontally.</li> </ul> <p>When solving this join/result unknown problem, it is important that students use a method that makes sense to them. Some strategies students are likely to use include modeling the problem with materials (building the initial quantity, building the second quantity, joining them together and counting to find the final quantity) and counting (on from the initial or greater quantity). Students may also knowledge of number relationships (e.g., <math>18 + 10 = 28</math>; <math>28 + 2 = 30</math>; <math>30 + 5 = 35</math>).</p>

<p><b>LAUNCH</b></p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• 100 charts, one per student (P. TR 33)</li> <li>• Traveling on the 100 Chart overhead</li> </ul>	<p><b>Introducing: Traveling on the 100 Chart</b></p> <ul style="list-style-type: none"> <li>• Students locate a start number on the 100 chart. They add a given number.</li> <li>• Students locate the sum and a few report how they figured out the ending number.</li> </ul> <table border="1" data-bbox="630 428 1068 890"> <thead> <tr> <th><u>Start</u></th> <th><u>Add on</u></th> </tr> </thead> <tbody> <tr><td>12</td><td>5</td></tr> <tr><td>12</td><td>10</td></tr> <tr><td>12</td><td>20</td></tr> <tr><td>26</td><td>3</td></tr> <tr><td>26</td><td>10</td></tr> <tr><td>26</td><td>20</td></tr> <tr><td>34</td><td>4</td></tr> <tr><td>34</td><td>10</td></tr> <tr><td>34</td><td>20</td></tr> <tr><td>34</td><td>30</td></tr> <tr><td>34</td><td>40</td></tr> </tbody> </table>	<u>Start</u>	<u>Add on</u>	12	5	12	10	12	20	26	3	26	10	26	20	34	4	34	10	34	20	34	30	34	40
<u>Start</u>	<u>Add on</u>																								
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<p><b>EXPLORE</b></p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• Traveling on the 100 Chart worksheet</li> </ul>	<p><b>Traveling on the 100 Chart</b></p> <ul style="list-style-type: none"> <li>• Have students build their own table, inserting their own numbers.</li> <li>• Have them give start and add on numbers to a partner; partners share how they figured out the ending number.</li> </ul>																								
<p><b>PRACTICE</b></p>	<p><b>As time allows:</b> pages 159 and/or 160:</p>																								
<p><b>SUMMARIZE</b></p>	<p><b>Closure:</b></p> <ul style="list-style-type: none"> <li>• Revisit purpose of the lesson with students.</li> <li>• See Assess, TE, P. 160: <i>How are <math>50 + 20</math> and <math>50 + 2</math> different?</i></li> </ul>																								
<p><b>HOMEWORK</b></p>	<p><b>Suggestion:</b> See Advanced Learners, TE, Page 160A. Students make up word problems that involve counting on by ones or tens (e.g., <i>Marco gives me 23 jelly beans. Anita gives me 30 jelly beans. How many jelly beans do I have now?</i>).</p>																								

Traveling on the 100 Chart

Start number	Add On	Stop number

DAY 3  
Chapter 11: Explore Two-Digit Addition  
LESSON 11.3  
TE P. 161A

<b>LESSON FOCUS:</b>	<b>Adding One Digit to Two Digits</b>
<b>CALIFORNIA STANDARD:</b>	<b>Number Sense: 2.0</b> Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers.
<b>Purpose of Lesson:</b>	<b>Generate ways of adding one-digit to two-digit numbers.</b>
<b>Routine</b>  <b>Materials:</b> <ul style="list-style-type: none"> <li>• coins</li> <li>• base ten materials (a variety, including commercially available materials, bundles of sticks, beans and cups, and snap cubes)</li> </ul>	<b>Suggestion: Number of the Day</b> Encourage students to use money to represent the Number of the Day (e.g., $25¢ + 25¢ = 50¢$ , $10¢ + 10¢ + 10¢ + 10¢ + 10¢ = 50¢$ , $25¢ + 10¢ + 10¢ + 5¢ = 50¢$ ). Have them prove their sum by recombining numbers. <b>Suggestion: Solving Problems</b> <ul style="list-style-type: none"> <li>• Give students a problem to solve: <i>42 students were in the cafeteria. 25 left to go on the playground. How many students are still in the cafeteria?</i></li> <li>• To ensure that students understand what is happening in the problem, ask volunteers to retell the story problem.</li> <li>• Discuss: what are ways that you could solve this problem?</li> <li>• Ask students to solve the problem using tools and strategies they understand.</li> <li>• Make manipulatives available.</li> <li>• Ask students to share their methods for solving the problem with the whole class.</li> <li>• Chart students' strategies.</li> <li>• Discuss how to represent the problem in an equation.</li> <li>• Record the equation horizontally.</li> </ul> <p>When solving this separate/result unknown problem, it is important that students use a method that makes sense to them. While this appears to be a subtraction problem, some students may solve it using an addition strategy. Some strategies students are likely to use include modeling the problem with materials (building the initial quantity, separating out the second quantity, and counting to find the final quantity) and counting (back from the initial or on from the separated to the initial quantity). Students may also use knowledge of number relationships  (e. g., <math>42 - 20 = 32</math>; <math>32 - 5 = 27</math>).</p>

<p><b>LAUNCH</b></p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• base ten materials (flats, longs and units)</li> <li>• two dice per small group</li> <li>• Workmat 3 (P. TR 116; optional).</li> </ul>	<p><b>Introduce: Race for a Flat</b></p> <p>Students discuss what they notice about the materials.</p> <ul style="list-style-type: none"> <li>• After they discover the value of each different type, talk about the various names of the pieces: units/ones, longs/tens, flats/hundred.</li> <li>• Take turns (model teacher against the class or one other student). Roll two dice and take that many units.</li> <li>• To ensure that students understand what is happening in the problem, ask volunteers to retell the story problem.</li> <li>• Discuss: <i>What can you do if you have more than 10 units? What number do you have now? How many more units do you need to make a trade?</i> Pass the dice and continue playing. Each time, players make necessary trades before passing the dice. The first player to trade ten longs for one flat is the winner.</li> <li>• Players first play two against two, to check for understanding of the game directions and ensure they are reporting the answers to the following: <i>What number do you have now? How many more units do you need to make a trade?</i></li> </ul>
<p><b>EXPLORE</b></p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• base ten materials (flats, longs and units)</li> <li>• two dice per small group</li> <li>• Workmat 3 (P. TR 116; optional)</li> </ul>	<p><b>Race for a Flat</b></p> <p>Students play Race for a Flat. Players first play two against two, to check for understanding of the game directions and ensure they are reporting the answers to the following: <i>What number do you have now? How many more units do you need to make a trade?</i></p>
<p><b>PRACTICE</b></p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• base ten materials (flats, longs, and units)</li> <li>• Workmat 3 (P. TR 116; optional)</li> </ul>	<p><b>As time allows:</b></p> <ul style="list-style-type: none"> <li>• Students work in pairs to locate an equation on page 161 or 162. Partners build the problem.</li> <li>• Students connect with their experience playing Race for a Flat. They consider and discuss with their partner: <i>Imagine you are playing Race for a Flat. You have the first addend and add the second addend on the next roll.</i></li> <li>• <i>Would you need to trade?</i></li> <li>• <i>How many longs/tens would you have?</i></li> <li>• <i>How many units/ones would you have?</i></li> </ul>
<p><b>SUMMARIZE</b></p>	<p><b>Closure:</b> Revisit purpose of the lesson with students. <i>You are playing Race for a Flat. You have 19 and you roll 12. What would you have? How do you know? Do you trade? How many? Are there any leftovers? How many? What equation could you write?</i></p>
<p><b>HOMEWORK</b></p>	<p><b>Suggestion:</b> Students record equations that are equal to today's Number of the Day. Students write about the following: <i>Would you say the Number of the Day if you were counting by 2s? 5s? 10s? How do you know?</i></p>

DAY 4  
 Chapter 11: Explore Two-Digit Addition  
 LESSON 11.4  
 TE P. 163A

<b>LESSON FOCUS:</b>	<b>Two-Digit Addition</b>
<b>CALIFORNIA STANDARD:</b>	<b>Number Sense: 2.0</b> Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers.
<b>Purpose of Lesson:</b>	<b>Use models to understand regrouping in addition.</b>
<p><b>Routine</b></p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• base ten materials (a variety, including commercially available materials, bundles of sticks, beans and cups, and snap cubes)</li> </ul>	<p><b>Suggestion: Solving Problems</b></p> <ul style="list-style-type: none"> <li>• Give students a problem to solve: <i>Ms. Johnson had 14 pencils. Mr. Gomez gave her 28 pencils. How many pencils does Ms. Johnson have now?</i></li> <li>• To ensure that students understand what is happening in the problem, ask volunteers to retell the story problem.</li> <li>• Discuss: <i>What are ways that you could solve this problem?</i></li> <li>• Ask students to solve the problem using tools and strategies they understand. Make manipulatives available.</li> <li>• Ask students to share their methods for solving the problem with the whole class.</li> <li>• Chart students' strategies. Discuss how to represent the problem in an equation.</li> <li>• Record the equation horizontally.</li> </ul> <p>When solving this join/result unknown problem, it is important that students use a method that makes sense to them. Some strategies students are likely to use include modeling the problem with materials (building the initial quantity, building the second quantity, joining them together and counting to find the final quantity) and counting (on from the initial or greater quantity). Students may also use knowledge of number relationships (e.g., <math>28 + 10 = 38</math>; <math>38 + 2 = 40</math>; <math>40 + 2 = 42</math>).</p> <p><b>Suggestion: Homework Sharing</b> Students share their Number of the Day work from Homework Lesson 11.3.</p>
<p><b>LAUNCH</b></p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• base ten materials (a variety, including commercially available materials, bundles of sticks, beans and cups, and snap cubes)</li> </ul>	<p><b>Model: Regrouping/Trading</b></p> <ul style="list-style-type: none"> <li>• See Model Regrouping and Nonregrouping in TE, Page 163A.</li> <li>• Introduce to students that this is one way of solving the problem above. You may want students to use connecting cubes in trains of tens/loose ones, cups of ten beans/loose ones, bundles of ten sticks/loose ones.</li> </ul>

<b>EXPLORE</b>  <b>Materials:</b> <ul style="list-style-type: none"><li>• base ten materials (flats, longs, and units)</li><li>• Workmat 3 (P. TR 116; optional)</li></ul>	<b>Race for a Flat</b> Students play Race for a Flat in small groups.
<b>PRACTICE</b>	<b>As time allows:</b> <ul style="list-style-type: none"><li>• Students choose 2 – 4 problems from pages 163 and 164.</li><li>• They write stories for some of the problems they have chosen on another sheet of paper.</li><li>• Students solve the problems using ways that they understand and/or the method demonstrated in Launch, Model Regrouping/Trading.</li></ul>
<b>SUMMARIZE</b>	<b>Closure:</b> <ul style="list-style-type: none"><li>• Revisit purpose of the lesson with students.</li><li>• Students share a problem they wrote and solved.</li><li>• Ask, <i>Did you need to regroup? Why or why not? Who had a similar strategy?</i></li></ul>
<b>HOMEWORK</b>	<b>Suggestion:</b> Students write stories for $39 + 34$ , $27 + 13$ , and $15 + 7$ .

DAY 5  
Chapter 11: Explore Two-Digit Addition  
LESSON 11.5  
TE P. 165A

<b>LESSON FOCUS:</b>	<b>Problem Solving: Make a Model</b>
<b>CALIFORNIA STANDARD:</b>	<b>Number Sense: 2.0</b> Students estimate, calculate, and solve problems involving addition and subtraction of two- and three-digit numbers.
<b>Purpose of Lesson:</b>	<b>Model story problems using regroup/trading and nonregrouping.</b>
<b>Routine</b>  <b>Materials:</b> <ul style="list-style-type: none"> <li>• base ten materials (a variety, including commercially available materials, bundles of sticks, beans and cups, and snap cubes)</li> </ul>	<b>Suggestion: Solving Problems</b> <ul style="list-style-type: none"> <li>• Give students a problem to solve: <i>Mr. Peters has 32 students. Mrs. Gordon has 19 students. How many more students does Mr. Peters have than Mrs. Gordon?</i></li> <li>• To ensure that students understand what is happening in the problem, ask volunteers to retell the story problem.</li> <li>• Discuss: <i>What are ways that you could solve this problem?</i></li> <li>• Ask students to solve the problem using tools and strategies they understand. Make manipulatives available.</li> <li>• Ask students to share their methods for solving the problem with the whole class. Chart students' strategies. Discuss how to represent the problem in an equation. Record the equation horizontally.</li> </ul> <p>While there is a tendency to teach this compare/difference unknown problem as a subtraction situation, it is important that students use a method that makes sense to them. Some strategies students are likely to use include modeling the problem with materials (building each quantity and counting the difference between the two) and counting (on from the lesser quantity or back from the greater quantity). Students may also knowledge of number relationships (e.g., <math>32 - 10 = 22</math>; <math>22 - 9 = 13</math>).</p>
<b>LAUNCH</b>  <b>Materials:</b> <ul style="list-style-type: none"> <li>• base ten materials (a variety, including commercially available materials, bundles of sticks, beans and cups, and snap cubes)</li> </ul>	<b>Model: Regrouping/Trading</b> <ul style="list-style-type: none"> <li>• Individual students share homework stories from Lesson 11.4.</li> <li>• Discuss what is happening in the problem. Ask students to retell the story in their own words. Students suggest how they might begin solving the problem. Ask students to solve the problem in way that makes sense to them. Make manipulatives available. Ask students to share their methods for solving the problem with the whole class.</li> <li>• Record what they did on a class chart. Discuss how to represent the problem in an equation. Record the equation horizontally (see Model Story Problems and Reading Support in TE, page 165A for additional support).</li> </ul>

<p><b>EXPLORE</b></p> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• base ten materials (a variety, including commercially available materials, bundles of sticks, beans and cups, and snap cubes)</li> </ul>	<p><b>Solving Homework Stories</b></p> <p>Students work in pairs.</p> <ul style="list-style-type: none"> <li>• One student reads a homework story to the partner.</li> <li>• The partner retells the story in his or her own words, solves the problem and explains the method used.</li> <li>• Students take turns.</li> </ul>
<p><b>PRACTICE</b></p>	<p><b>As time allows:</b></p> <ul style="list-style-type: none"> <li>• Students choose 2 – 4 problems from Pages. 165 and 166 (you may want to pick a problem for all students to solve).</li> <li>• Students read the problem, explain it to a partner, solve it and record a horizontal equation to match the method used. Students solve the problems using ways that they understand and/or the method demonstrated in Launch, Model Regrouping/Trading, Day 52.</li> </ul>
<p><b>SUMMARIZE</b></p>	<p><b>Closure:</b></p> <ul style="list-style-type: none"> <li>• Revisit purpose of the lesson with students.</li> <li>• Students share a problem they wrote and solved. This problem could be the one all students were assigned.</li> </ul>
<p><b>HOMEWORK</b></p>	<p><b>Suggestion:</b></p> <ul style="list-style-type: none"> <li>• Students record equations that are equal to today's Number of the Day.</li> <li>• Students write about the following: <i>Would you say the Number of the Day if you were counting by 2s? 5s? 10s? How do you know?</i></li> </ul>

