



Differentiation in Investigation 3

Mathematics in This Investigation

The mathematics continues to focus on place value and on developing strategies for solving addition and subtraction problems with totals to 100.

Additional Resource: *What to Do With the Seven*, pages 97–99 (See *Implementing Investigations in Grade 2*)

Understanding the Mathematics

Students accurately and efficiently solve 2-digit addition and subtraction problems by using various strategies. They may add on or count back by 10s or a multiple of 10 first and then ones to find the answer, or they may jump forward or back to the closest multiple of 10 and then continue adding or subtracting 10s or multiples of 10.

Option: Assign the **Extension** activity.

Partially Understanding the Mathematics

Students solve 2-digit addition and subtraction problems with totals up to 100 but may make minor errors in their computation. They may use a strategy of counting on or back by ones when solving subtraction problems or use tools such as tallies, a 100 chart, or their fingers to help them solve the problem.

Option: Assign the **Practice** activity.

Not Understanding the Mathematics

Students are thinking and working primarily in ones and are not yet fluent with the equivalence of ten 1s equaling one 10. They solve addition problems by counting all or counting on by ones. They may solve subtraction problems by counting all and removing some.

Option: Assign the **Intervention** activity.

Investigation 3 Quiz

In addition to your observations and students' work in Investigation 3, the Quiz (R52) can be used to gather more information.

Name _____ Date _____

How Many Tens? How Many Ones?

Quiz

Choose the correct answer.

- Tia has 5 dimes and 5 pennies. Which of the following coins are equal to this?

<input type="radio"/> (A) 1 quarter and 2 dimes	<input type="radio"/> (C) 2 quarters and 1 dime
<input type="radio"/> (B) 1 quarter and 5 nickels	<input type="radio"/> (D) 2 quarters and 1 nickel
- Which equation equals 50?

<input type="radio"/> (A) $20 + 25 - 15 - 20$	<input type="radio"/> (C) $5 + 25 - 10 + 30$
<input type="radio"/> (B) $10 + 20 + 20 - 10$	<input type="radio"/> (D) $30 - 5 + 15 - 20$
- Which is not equal to 100?

<input type="radio"/> (A) 10 dimes	<input type="radio"/> (C) 10 strips of 10 stickers
<input type="radio"/> (B) 10 nickels	<input type="radio"/> (D) 10 towers of 10 cubes
- Solve the problem. Use another piece of paper to show your work.
 Leo is playing *Get to 100*. He rolls $20 + 15 + 30 + 10 + 5$. How much more does he need to get to 100?
20; review students' work.

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R52 Unit 6

Use after Session 3.6.

Intervention



30 MIN



INDIVIDUALS

Adding and Subtracting on a 100 Chart

Use anytime after Session 3.3.

Math Focus Points

- ◆ Adding and subtracting 10 and multiples of 10 to/from any number

Materials: pocket 100 chart, pocket 100 chart numbers, M5

Place the following numbers in a pocket 100 chart: 4, 16, 23, 38, 41, 55, 67, 72, 90, and 99. **Our first task today is to complete the 100 chart. I'll show a number, and you raise your hand if you know where it goes.** Display number cards one at a time and have volunteers place them in their correct positions on the 100 chart. **How did you decide where to put [52]?**

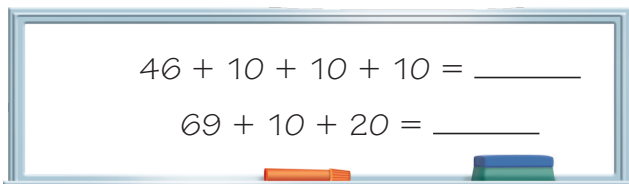
Students might say:



"The number [55] is showing, so I counted backward to [52]."

When the 100 chart has been completed, write the following equation on the board: $38 + 10 + 10 = \underline{\quad}$. **Who can show how to solve this equation using the 100 chart?** Have volunteers demonstrate their strategies and explain their thinking.

Distribute a 100 Chart (M5) to each student. Repeat the process for $46 + 10 + 10 + 10 = \underline{\quad}$. **Use your 100 chart to figure out the answer to this problem.** Have students share their strategies. **How do the numbers on the 100 chart change when you add 10?** Repeat the process for the equation $69 + 10 + 20 = \underline{\quad}$.



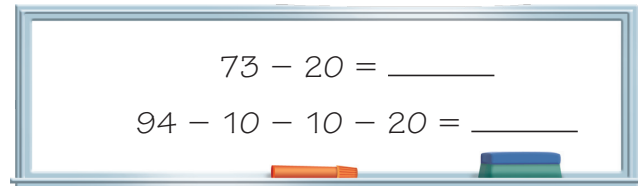
Next write the following subtraction problem on the board: $62 - 10 - 10 - 10 = \underline{\quad}$. **How can you use the 100 chart to solve this problem? How is subtracting on the 100 chart different from adding on the 100 chart?** Ask students to look at the numbers 62, 52, 42, 32 and discuss what part of the number changes and what part stays the same.

Students might say:



"Start on 62 and move up one row to 52. Then move up another row to 42 and then up another row to 32."

Display $73 - 20 = \underline{\quad}$ and $94 - 10 - 10 - 20 = \underline{\quad}$ on the board. Have students solve them individually using their own 100 chart and then discuss each solution as a group.



ELL English Language Learners

Provide Sentence Stems Provide sentence stems, such as the following, to support students who have difficulty explaining their thinking.

I started on _____.

I [added] _____.

I landed on _____.

Additional Resource



Student Math Handbook

Game: *Guess My Number on the 100 Chart* SMH G8

Materials: 100 chart

Variation: Students play on teams. Turns pass from team to team.

Practice



Addition and Subtraction Equations

Use anytime after Session 3.3.

Math Focus Points

- ◆ Adding and subtracting 10 and multiples of 10 to/from any number

Materials: envelopes or resealable bags, 2×2 pieces of paper, R53, R89

Name _____ Date _____	
How Many Tens? How Many Ones?	
Addition and Subtraction Equations	
Solve the problems. Show your work.	
1. $62 + 10 + 10 + 8 = \underline{\quad}$ 90; review students' work.	2. $45 + 20 - 10 + 5 = \underline{\quad}$ 60; review students' work.
3. $76 - 10 - 10 - 6 = \underline{\quad}$ 50; review students' work.	4. $98 - 20 + 12 = \underline{\quad}$ 90; review students' work.
5. $39 + 30 + 11 - 10 = \underline{\quad}$ 70; review students' work.	6. $54 - 20 + 10 - 8 = \underline{\quad}$ 36; review students' work.
Use anytime after Session 3.3.	
Unit 6 R53	

Materials to Prepare: Make a deck of Addition and Subtraction Equation Cards (R89) for each student. Place each deck in an envelope or resealable bag.

Distribute a deck of cards and several 2×2 pieces of paper to each student. Explain the following steps:

1. On 2×2 paper, Player 1 secretly writes a start number and Player 2 secretly writes a target number. Numbers should be between 10 and 99.
2. Players use number and symbol cards to make an equation that equals their target number, adding and subtracting numbers. Partners check each other's work, then record their equations.
3. Players switch roles and secretly record new start and target numbers, then make a new equation.

Demonstrate how to play using 43 as your start number and 50 as the target number. Use cards to display $43 + 10 + 7 - 10 =$.

This is my equation. How can we solve it to make sure it equals my target number?

Students might say:



"Count up 10 to 53. Add 7: $3 + 7 = 10$, so that's 60. Then count back by 10. That's 50."



"It's like Today's Number. Plus 10 and minus 10 equals 0, so don't count them. Just add the 7: $43 + 7 = 50$."

As students work on the activity, circulate to listen to explanations and check equations.

This game can be made easier by using only addition (or only subtraction) and selecting a start number that is between 10–49 and a target number that is 50–99. A more difficult variation is to limit the number of number cards used for each equation (e.g., use only 5 number cards).

Distribute copies of Addition and Subtraction Equations (R53).

ELL English Language Learners

Model Thinking Aloud Model your thinking for finding the solution to the equation. For example: **First, I added 43 and 10: $43 + 10 = 53$. Then, I added on 7 more: $53 + 7 = 60$. Finally, I subtracted 10: $60 - 10 = 50$.**

Additional Resource



Student Math Handbook

Game: Get to 100 SMH G7

Materials: multiple-of-5 cubes, 100 charts, game pieces, M24

Extension



Get to 0

Use anytime after Session 3.5.

Math Focus Points

◆ Subtracting amounts from 100 or \$1.00, down to 0

Materials: chart paper, 100 charts, multiple-of-5 number cubes (2 per pair), game pieces, blank paper, M5 (1 per pair), R54

Name _____ Date _____

How Many Tens? How Many Ones?

Get to 0

Anita and Darren are playing *Get to 0*. Below are the numbers they rolled. Write an equation for each problem. Show your work.

1. Anita's game piece is on 50. She rolls 20 and 15. On what number should she put her game piece now? 15

Equations will vary; review students' work.

What numbers does Anita need to roll to get exactly to 0? 5 and 10

Equations will vary; review students' work.

2. Darren's game piece is on 65. He rolls 20 and 25. On what number should he put his game piece now? 20

Equations will vary; review students' work.

What numbers does Darren need to roll to get exactly to 0? 10 or 5 and 10 or 15

Equations will vary; review students' work.

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R54 Unit 6 Use anytime after Session 3.5.

Students play *Get to 0*, a variation of *Get to 100*. Explain that in this version of the game, they start on 100 and subtract down to 0.

Post the game rules on chart paper so that students can refer to them if needed.

Display a 100 chart and model a few rounds of the game with a student partner. **I'll go first. I rolled a 5 and a 10. On what number should I put my game piece? How do you know?**

Students might say:



"You could subtract $100 - 10$; that's 90. Then $90 - 5 = 85$."

Get to 0 Rules

- Both players place a game piece on the number 100 on the 100 chart.
- Player 1 rolls 2 multiple-of-5 cubes, subtracts that many from 100, and records the equation. Player 1 moves his or her game piece to the square showing the difference.
- Now player 2 takes a turn and repeats step 2.
- On the next turn, players subtract from the number on which their game pieces are sitting.
- The game is over when one player reaches 0 or goes past it off the 100 chart.

Have pairs of students play *Get to 0*. Check with each pair to be sure that they understand the rules. Remind them to record an equation after each turn to show how they moved.

Distribute copies of *Get to 0* (R54).

ELL English Language Learners

Use Repetition Review the rules of the game. Have students act out each step. If students seem confused, simplify the language and model the steps for them. **First, roll the cubes. Then, subtract the 2 numbers that come up. I rolled a [10] and a [5]: $100 - 10 = 90$; $90 - 5 = 85$.] Now move the game piece to [85].**

Additional Resource



Student Math Handbook

Game: Spend \$1.00 SMH G13

Materials: dot cubes or number cubes, coin sets, M36

Variation: At the end of each turn, try to make trades so that you have the fewest possible coins.