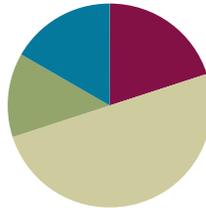


Lesson 18

Objective: Use manipulatives to represent additions with two compositions.

Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Concept Development	(30 minutes)
■ Application Problem	(8 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



Fluency Practice (12 minutes)

- Making the Next Ten to Add **2.NBT.5** (3 minutes)
- Sprint: Addition Crossing a Ten **2.NBT.5** (9 minutes)

Making the Next Ten to Add (3 minutes)

Note: This fluency exercise reviews foundations that lead into today's lesson.

T: When I say $9 + 4$, you say $10 + 3$. Ready? $9 + 4$.

S: $10 + 3$.

T: Answer.

S: 13.

Continue with the following possible sequences:

$19 + 4$, $29 + 4$, $79 + 4$, $9 + 6$, $19 + 6$, $29 + 6$, $8 + 3$, $18 + 3$, $48 + 3$, $8 + 5$, $18 + 5$, $88 + 5$, $7 + 6$, $27 + 6$, $7 + 4$, $17 + 4$, and $67 + 4$.

Post on board:

$$9 + 4 = \underline{\quad}$$

$$\wedge$$

$$1 \quad 3$$

$$9 + 1 = 10$$

$$10 + 3 = \underline{\quad}$$

Sprint: Addition Crossing a Ten (9 minutes)

Materials: (S) Addition Crossing a Ten Sprint

Note: This Sprint reviews completing or crossing a ten when adding a single-digit number to a two-digit number.

Concept Development (30 minutes)

Materials: (S) Per pair: unlabeled hundreds place value chart (Template), place value disks (2 hundreds, 18 tens, 18 ones), place value disks (Lesson 6 Template)

Problem 1: $40 + 70$

- T: (Write $40 + 70$ on the board.) Partner A, show 40 on your place value chart. Partner B, show 70. Be sure to arrange the place value disks in 5-groups.
- T: Partner A, put your disks together with your partner's disks. 4 tens + 7 tens is...?
- S: (Partner A moves the tens together to make two 5-groups and 1 more ten.) 11 tens!
- T: 11 tens equals...?
- S: 110! → 1 hundred 1 ten.
- T: You've made a unit of 1 hundred! 11 tens is the same as 1 hundred 1 ten. Partner B, exchange 10 tens disks for 1 hundreds disk.
- S: (Partner B changes 10 tens for 1 hundreds disk and places it in the hundreds place.)
- T: How many ones in the ones place?
- S: 0!
- T: How many tens in the tens place?
- S: 1 ten!
- T: How many hundreds in the hundreds place?
- S: 1 hundred!
- T: 1 hundred + 1 ten equals...?
- S: 110!
- T: $40 + 70$ equals...?
- S: 110!

Problem 2: $49 + 73$

- T: Let's now include ones in our addends.
- T: Partner A, change your number from 40 to 49. Partner B, change your number from 70 to 73.
- T: Now, we have a new related addition problem. (Write $49 + 73$.) Discuss with your partner how this problem will be different than $40 + 70$.
- S: This time, we have ones, too. → The total of the ones is more than 9, so we are going to be changing 10 ones for 1 ten. → So, this time, we are going to bundle two times!
- T: Partner B, move the ones together. How many ones?
- S: (Move disks.) 12 ones.



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Earlier in the day, before the lesson, review important terminology and their meanings:

- *Addend*
- *Rename*
- *Bundle*
- *Expanded form*
- *Partners to ten*

Keep these words accessible on a math word wall or on the board for students to see as they are working.

MP.4

- T: What do you do next?
- S: Bundle 10 ones to make 1 ten. → Rename 12 ones as 1 ten 2 ones, and put a ten in the tens place.
- T: Partner B, show that change on your place value chart.
- S: (Model.)
- T: What's the next step?
- S: Add the tens!
- T: Partner A, move the tens. How many tens?
- S: (Move disks.) 12 tens.
- T: What do you do now?
- S: Bundle 10 tens and change it for a new unit of 1 hundred in the hundreds place. → Rename 12 tens as 1 hundred 2 tens.
- T: Partner A, show that change on your place value chart.
- S: (Model.)
- T: Using your model, what's $49 + 73$ in expanded form?
- S: $100 + 20 + 2 = 122$.
- T: Talk with your partner. How is making a hundred the same as making a ten?
- S: We can use partners to ten for both. → $6 + 4 = 10$, just like 6 tens + 4 tens is 10 tens, or 1 hundred. → When we put together 10 ones, we make a ten, and when we put together 10 tens, we make a hundred. → We trade 10 of a smaller unit for 1 of the next bigger unit: 10 ones for 1 ten and 10 tens for 1 hundred.



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

At times, pair students performing above grade level with struggling students. Encourage them to dialogue in Turn and Talk moments in the lesson. Listen carefully to their conversations, and encourage leadership in the advanced students and participation from the struggling students.

MP.4

Problem 3: $136 + 64$

- T: Yes! Let's use what you've discovered to solve another problem. (Write $136 + 64$.) Work with your partner to model these addends, these two parts, while I walk around to see how it's going.
- T: For each step in the addition, I will make a statement. As you move the disks to add, tell me if the statement is true or false. Raise your hand once you've moved the disks and have your answer.
- T: I change 10 ones for 1 ten.
- S: (Add the ones and rename.) True!
- T: I change 10 tens for 1 hundred.
- S: (Add the tens.) True!
- T: The total of the two parts is 200.
- S: True!
- T: Explain to your partner how you know when to rename.
- S: We rename when we have enough to make a group of 10. → We rename when we make ten in any place. → We rename when we have more than 9 ones or tens.

As students demonstrate understanding of renaming, allow them to work on the Problem Set independently. Continue to support struggling students' conceptual understanding at the concrete level.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

Application Problem (8 minutes)

Hailey and Gio solve $56 + 85$. Gio says the answer is 131. Hailey says the answer is 141. Explain whose answer is correct using numbers, pictures, or words.

Note: This problem prompts students to synthesize the concepts developed in today’s lesson. Each time they make ten of a given unit, they rename it as 1 of the next larger unit. Have students solve independently and then share their thinking with the class.

Handwritten student work for the application problem. It includes a number line for 56 and 85, a vertical addition problem showing 56 + 85 = 141, and a place value chart with 100 disks in the hundreds column and 1 disk in the ones column. Below the work, it says "Hailey is correct because 56 + 85 = 141."

Student Debrief (10 minutes)

Lesson Objective: Use manipulatives to represent additions with two compositions.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- Look at Problem 1(a–c). How do the problems in the first column help you to solve the problems in the second column? Did you need to model the problems in the second column? (Did you need to compose a ten or a hundred?)
- For Problem 2, how did you use your place value disks to determine whether the statements were true or false?

COMMON CORE Lesson 18: Use manipulatives to represent additions with two compositions. engage^{ny} 4.0.21
 Name: Ben Date: _____
 1. Solve using your place value chart and place value disks.
 a. $80 + 30 = 110$ $90 + 40 = 130$
 b. $73 + 38 = 111$ $73 + 49 = 122$
 c. $93 + 38 = 131$ $42 + 99 = 141$
 d. $84 + 37 = 121$ $69 + 63 = 132$
 e. $113 + 78 = 191$ $128 + 72 = 200$
 2. Circle the statements that are true as you solve each problem using place value disks.
 a. $47 + 123$
 I change 10 ones for 1 ten. (circled)
 I change 10 tens for 1 hundred.
 The total of the two parts is 160.
 The total of the two parts is 170. (circled)
 b. $97 + 54$
 I change 10 ones for 1 ten. (circled)
 I change 10 tens for 1 hundred.
 The total of the two parts is 141.
 The total of the two parts is 151. (circled)

- Use place value language to explain to your partner how you solved Problem 3. Did you need to compose a ten or a hundred to solve? Or, did you solve mentally? Which method is easier?
- For Problem 5, share your work with a partner. Who was correct, Kim or Stacy? Defend your response.
- Make a prediction. What will happen when you have 10 hundreds disks? How do you know? What happens when you have 10 of a given unit?

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 18 Problem Set 2•4

3. Write an addition sentence that corresponds to the following number bond. Solve the problem using your place value disks and fill in the missing total.

$45 + 95 = 140$

$$\begin{array}{r} 45 \\ + 95 \\ \hline 140 \end{array}$$

4. There are 50 girls and 80 boys in the after school program. How many children are in the after school program?

80 boys 50 girls

5 tens + 8 tens = 13 tens

so

$50 + 80 = 130$

There are 130 children in the after school program.

5. Kim and Stacy solved $83 + 39$. Kim's answer was less than 120. Stacy's answer was more than 120. Whose answer was incorrect? Explain how you know using words, pictures, or numbers.

83 39

$83 + 39 = 122$

hundreds tens ones

3 hundred + 2 tens + 2 ones

Before I even added I knew the answer would be at least 120 because I had 11 tens on my place value chart and more than 10 ones. I knew I would have at least 12 tens. Then I added and got 122. Stacy was correct.

COMMON CORE Lesson 18: Use manipulatives to represent additions with two compositions. Date: 6/2/14 engage^{ny} 4.D.22

A

Correct _____

Add.

1	$38 + 1 =$		23	$85 + 7 =$	
2	$47 + 2 =$		24	$85 + 9 =$	
3	$56 + 3 =$		25	$76 + 4 =$	
4	$65 + 4 =$		26	$76 + 5 =$	
5	$31 + 8 =$		27	$76 + 6 =$	
6	$42 + 7 =$		28	$76 + 9 =$	
7	$53 + 6 =$		29	$64 + 6 =$	
8	$64 + 5 =$		30	$64 + 7 =$	
9	$49 + 1 =$		31	$76 + 8 =$	
10	$49 + 2 =$		32	$43 + 7 =$	
11	$49 + 3 =$		33	$43 + 8 =$	
12	$49 + 5 =$		34	$43 + 9 =$	
13	$58 + 2 =$		35	$52 + 8 =$	
14	$58 + 3 =$		36	$52 + 9 =$	
15	$58 + 4 =$		37	$59 + 1 =$	
16	$58 + 6 =$		38	$59 + 3 =$	
17	$67 + 3 =$		39	$58 + 2 =$	
18	$57 + 4 =$		40	$58 + 4 =$	
19	$57 + 5 =$		41	$77 + 3 =$	
20	$57 + 7 =$		42	$77 + 5 =$	
21	$85 + 5 =$		43	$35 + 5 =$	
22	$85 + 6 =$		44	$35 + 8 =$	

B Improvement _____ # Correct _____

	Add.				
1	$28 + 1 =$		23	$75 + 7 =$	
2	$37 + 2 =$		24	$75 + 9 =$	
3	$46 + 3 =$		25	$66 + 4 =$	
4	$55 + 4 =$		26	$66 + 5 =$	
5	$21 + 8 =$		27	$66 + 6 =$	
6	$32 + 7 =$		28	$66 + 9 =$	
7	$43 + 6 =$		29	$54 + 6 =$	
8	$54 + 5 =$		30	$54 + 7 =$	
9	$39 + 1 =$		31	$54 + 8 =$	
10	$39 + 2 =$		32	$33 + 7 =$	
11	$39 + 3 =$		33	$33 + 8 =$	
12	$39 + 5 =$		34	$33 + 9 =$	
13	$48 + 2 =$		35	$42 + 8 =$	
14	$48 + 3 =$		36	$42 + 9 =$	
15	$48 + 4 =$		37	$49 + 1 =$	
16	$48 + 6 =$		38	$49 + 3 =$	
17	$57 + 3 =$		39	$58 + 2 =$	
18	$57 + 4 =$		40	$58 + 4 =$	
19	$57 + 5 =$		41	$67 + 3 =$	
20	$57 + 7 =$		42	$67 + 5 =$	
21	$75 + 5 =$		43	$85 + 5 =$	
22	$75 + 6 =$		44	$85 + 8 =$	

Name _____

Date _____

1. Solve using your place value chart and place value disks.

a. $80 + 30 =$ _____ $90 + 40 =$ _____

b. $73 + 38 =$ _____ $73 + 49 =$ _____

c. $93 + 38 =$ _____ $42 + 99 =$ _____

d. $84 + 37 =$ _____ $69 + 63 =$ _____

e. $113 + 78 =$ _____ $128 + 72 =$ _____

2. Circle the statements that are true as you solve each problem using place value disks.

a. $47 + 123$

I change 10 ones for 1 ten.

I change 10 tens for 1 hundred.

The total of the two parts is 160.

The total of the two parts is 170.

b. $97 + 54$

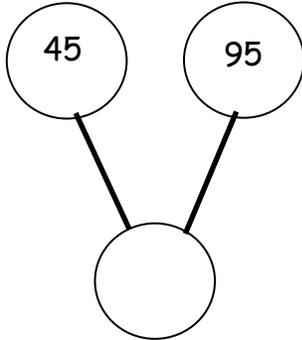
I change 10 ones for 1 ten.

I change 10 tens for 1 hundred.

The total of the two parts is 141.

The total of the two parts is 151.

3. Write an addition sentence that corresponds to the following number bond. Solve the problem using your place value disks, and fill in the missing total.



4. There are 50 girls and 80 boys in the after school program. How many children are in the after school program?
5. Kim and Stacy solved $83 + 39$. Kim's answer was less than 120. Stacy's answer was more than 120. Whose answer was incorrect? Explain how you know using words, pictures, or numbers.

Name _____

Date _____

Solve using your place value chart and place value disks.

1. $46 + 54 =$ _____

2. $49 + 56 =$ _____

3. $28 + 63 =$ _____

4. $67 + 89 =$ _____

Name _____

Date _____

1. Solve using your place value chart and place value disks.

a. $20 + 90 =$ _____ $60 + 70 =$ _____

b. $29 + 93 =$ _____ $69 + 72 =$ _____

c. $45 + 86 =$ _____ $46 + 96 =$ _____

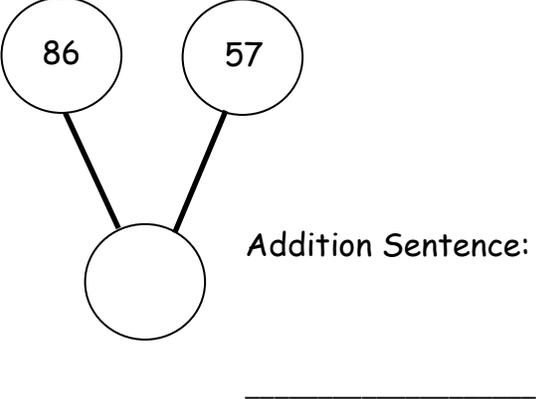
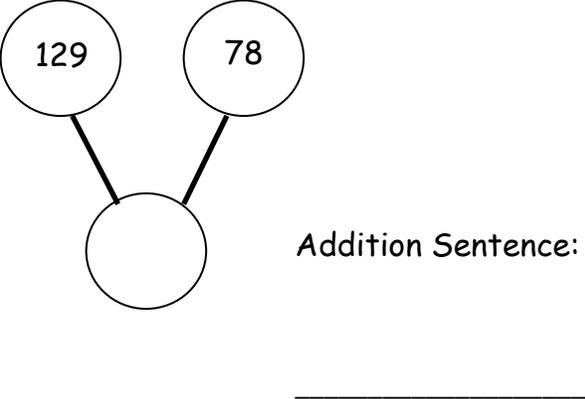
d. $47 + 115 =$ _____ $47 + 95 =$ _____

e. $28 + 72 =$ _____ $128 + 72 =$ _____

2. Circle the statements that are true as you solve each problem using place value disks.

a. $68 + 51$ I change 10 ones for 1 ten. I change 10 tens for 1 hundred. The total of the two parts is 109. The total of the two parts is 119.	b. $127 + 46$ I change 10 ones for 1 ten. I change 10 tens for 1 hundred. The total of the two parts is 163. The total of the two parts is 173.
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3. Solve the problem using your place value disks, and fill in the missing total. Then, write an addition sentence that relates to the number bonds.

<p>a.</p>  <p style="text-align: right;">Addition Sentence: _____</p>	<p>b.</p>  <p style="text-align: right;">Addition Sentence: _____</p>
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4. Solve using your place value chart and place value disks.

a. $45 + 55 =$ _____

b. $78 + 33 =$ _____

c. $37 + 84 =$ _____

unlabeled hundreds place value chart