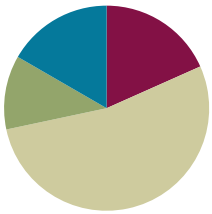
Lesson 15

Objective: Represent subtraction with and without the decomposition when there is a three-digit minuend.

Suggested Lesson Structure

Fluency Practice	(11 minutes)
Application Problem	(7 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Fluency Practice (11 minutes)

- Subtraction from Tens **2.NBT.5** (2 minutes)
- Sprint: Two-Digit Subtraction **2.NBT.5** (9 minutes)

Subtraction from Tens (2 minutes)

Materials: (S) Personal white board

Note: This fluency activity allows students to see how their take-from-ten facts help them to solve many problems.

T: When I say a basic fact, you add ten to the whole and continue until I say to stop. So, after 11 – 9, you would solve 21 – 9. Then?

S: 31 – 9, 41 – 9, 51 – 9.

T: Yes. Solve as many as you can on your personal white board before I give the signal to stop. Let's begin. 11 – 9.

S: (Work.)

When every student has completed at least two problems, stop the class and give the next expression.

Continue with the following possible sequence: 12 – 8, 11 – 8, and 13 – 9.

Sprint: Two-Digit Subtraction (9 minutes)

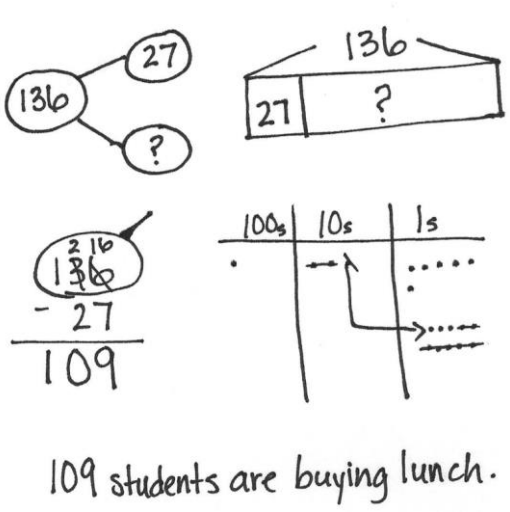
Materials: (S) Two-Digit Subtraction Sprint

Note: This Sprint reviews subtraction with unbundling to prepare students for today's lesson.

Application Problem (7 minutes)

There are 136 students in the second grade at Miles Davis Elementary. 27 of them brought bag lunches to school. The rest buy the hot lunch. How many students are buying a hot lunch?

Note: This Application Problem asks students to apply their understanding of decomposing when there is a three-digit minuend. Analyze part–whole relationships, draw the tape diagram together, and let students solve the problem independently. When they have finished, share exemplary but diverse student work so that students see how others are drawing their place value disks or chips.



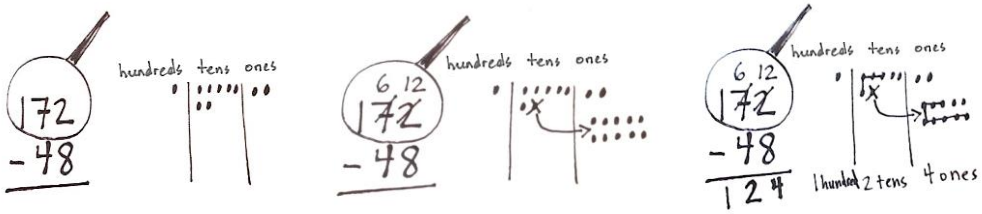
Concept Development (32 minutes)

Materials: (S) Math journal or paper

Note: The goal of place value models is to help students understand the quantities involved in written computation. As this understanding deepens, students no longer need to use models; they are able to solve with numbers alone.

This lesson is designed to give students ample time working with bare numbers and chip models to develop conceptual understanding and procedural fluency with the vertical form. It anticipates that students will grasp this understanding at different rates. As students demonstrate proficiency (i.e., as they are able to explain why they decomposed a ten using place value language), encourage them to dispense with the models.

Problem 1: 172 – 48



T: Copy the following problem onto your paper in vertical form: 172 – 48.

T: Before I can begin subtracting in vertical form, what must I always do?

S: Get ready to subtract!

T: For now, draw the chip model. Whisper count as you add chips to the place value chart. (Circulate as students set up their chip models, listening and looking to see that they are drawing them correctly.)

S: (Whisper as they add 1 hundred 7 tens and 2 ones to their chip models.)

T: Use place value language to tell your partner how you set up your drawing.

S: I put 1 unit in the hundreds place, 7 units in the tens place, and 2 units in the ones place. → I put 1 chip for 1 hundred, 7 chips for 70, and 2 chips for 2. → I showed the correct number of units for each digit.

T: Solve the problem using your chip model. As you solve, record your changes and answer in the vertical form.

T: When you're finished, check your work with a partner, and explain how your model matches the vertical form. Use place value language to explain each step.

Circulate to listen in on conversations, and offer support as needed.

T: The answer to 172 – 48 is…?

S: 124.

T: Let's draw a number bond to show that. What was our total?

S: 172.

T: Our parts are…?

S: 48 and 124.

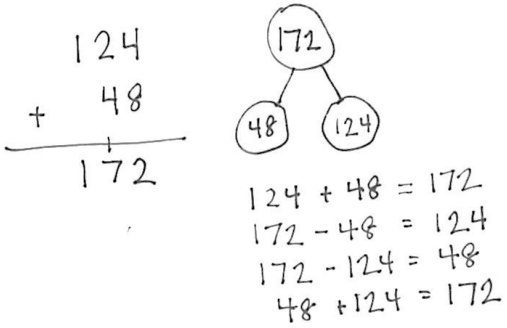
T: If we add together the parts, what should the total be?

S: 172.

T: Do that now. Add together the parts to see if you get the correct total.

S: It's the same! → Yeah, we got it right! → If we got it wrong, the total would be different.

T: Let's make two addition and two subtraction sentences for this number bond.



Have the students either generate as a whole class or work to write them down. Seeing the number bond with larger numbers helps bridge their part–whole understandings from smaller numbers to larger.

Repeat the procedure for the original activity in which students solve by drawing chip models and the vertical form. Use the following possible sequence: 154 – 39, 142 – 18, and 135 - 27.

Continue to support students who need assistance. Allow students who demonstrate proficiency with the models and vertical form to work on the Problem Set independently.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

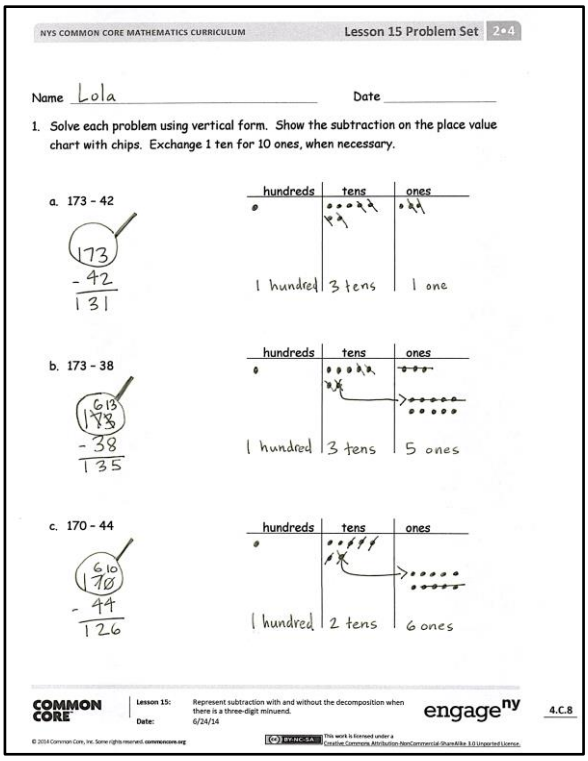
Allow students to use place value disks, labeled disk drawings, and chip models for as long as is necessary to demonstrate proficiency in this method.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

On the Problem Set, encourage early finishers to check their answers by using addition. Both parts should add up to the original whole (i.e., the difference plus the subtrahend should equal the minuend). If they made a mistake, encourage them to work with a partner to discover the reason why and to correct the problem. This can help prevent the habit of valuing speed over accuracy, as it discourages students from habituating to incorrect procedures.

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.


NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 15 Problem Set 2•4

Name Lola Date

1. Solve each problem using vertical form. Show the subtraction on the place value chart with chips. Exchange 1 ten for 10 ones, when necessary.

a. 173 - 42

173
- 42
131

hundreds tens ones
1 hundred 3 tens 1 one

b. 173 - 38

613
173
- 38
135

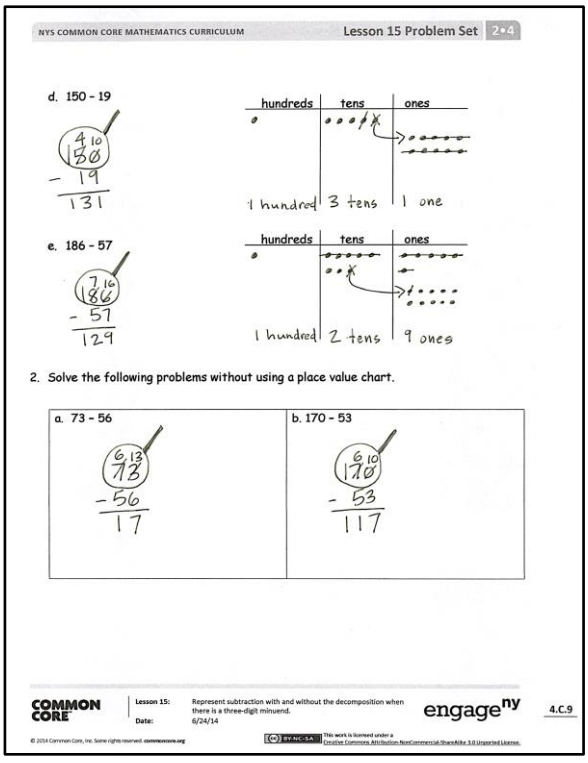
hundreds tens ones
1 hundred 3 tens 5 ones

c. 170 - 44

610
170
- 44
126

hundreds tens ones
1 hundred 2 tens 6 ones

COMMON CORE Lesson 15: Represent subtraction with and without the decomposition when there is a three-digit minuend. Date: 6/24/14 engage^ny 4.C.8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d. 150 - 19

410
150
- 19
131

hundreds tens ones
1 hundred 3 tens 1 one

e. 186 - 57

716
186
- 57
129

hundreds tens ones
1 hundred 2 tens 9 ones

2. Solve the following problems without using a place value chart.

a. 73 - 56

613
73
- 56
17

b. 170 - 53

610
170
- 53
117

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Student Debrief (10 minutes)

Lesson Objective: Represent subtraction with and without the decomposition when there is a three-digit minuend.

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.

Any combination of the questions below may be used to lead the discussion.

- When you used the chip model for Problem 1(a), how did you know whether or not to decompose a ten? Was this the same in Problem 1(b)?
- For Problem 1(b), where did you write the unbundled ten as ones in vertical form? How did it match your chip model?
- For Problem 1(c), what number(s) did you draw on your place value chart? Why? Does subtracting from a three-digit number change how you subtract? MP.3
- For Problems 1(d) and (e), can you tell if you need to decompose a ten just by looking at the digits in the ones place? Explain how you know.
- Look at Problems 2(a) and (b). How did you solve these problems without using a place value chart? Did you draw a magnifying glass? What can you visualize?

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

A

Number Correct: _____

Two-Digit Subtraction

1.	53 – 2 =	
2.	65 – 3 =	
3.	77 – 4 =	
4.	89 – 5 =	
5.	99 – 6 =	
6.	28 – 7 =	
7.	39 – 8 =	
8.	31 – 2 =	
9.	41 – 3 =	
10.	51 – 4 =	
11.	61 – 5 =	
12.	30 – 9 =	
13.	40 – 8 =	
14.	50 – 7 =	
15.	60 – 6 =	
16.	40 – 30 =	
17.	41 – 30 =	
18.	40 – 20 =	
19.	42 – 20 =	
20.	80 – 50 =	
21.	85 – 50 =	
22.	80 – 40 =	
23.	84 – 40 =	
24.	80 – 50 =	
25.	86 – 50 =	
26.	70 – 60 =	
27.	77 – 60 =	
28.	80 – 70 =	
29.	88 – 70 =	
30.	48 – 4 =	
31.	80 – 40 =	
32.	81 – 40 =	
33.	46 – 3 =	
34.	60 – 30 =	
35.	68 – 30 =	
36.	67 – 4 =	
37.	67 – 40 =	
38.	89 – 6 =	
39.	89 – 60 =	
40.	76 – 2 =	
41.	76 – 20 =	
42.	54 – 6 =	
43.	65 – 8 =	
44.	87 – 9 =	

B

Number Correct: _____

Improvement: _____

Two-Digit Subtraction

1.	43 – 2 =	
2.	55 – 3 =	
3.	67 – 4 =	
4.	79 – 5 =	
5.	89 – 6 =	
6.	98 – 7 =	
7.	29 – 8 =	
8.	21 – 2 =	
9.	31 – 3 =	
10.	41 – 4 =	
11.	51 – 5 =	
12.	20 – 9 =	
13.	30 – 8 =	
14.	40 – 7 =	
15.	50 – 6 =	
16.	30 – 20 =	
17.	31 – 20 =	
18.	50 – 30 =	
19.	52 – 30 =	
20.	70 – 40 =	
21.	75 – 40 =	
22.	90 – 50 =	
23.	94 – 50 =	
24.	90 – 60 =	
25.	96 – 60 =	
26.	80 – 70 =	
27.	87 – 70 =	
28.	90 – 80 =	
29.	98 – 80 =	
30.	39 – 4 =	
31.	90 – 40 =	
32.	91 – 40 =	
33.	47 – 3 =	
34.	70 – 30 =	
35.	78 – 30 =	
36.	68 – 4 =	
37.	68 – 40 =	
38.	89 – 7 =	
39.	89 – 70 =	
40.	56 – 2 =	
41.	56 – 20 =	
42.	34 – 6 =	
43.	45 – 8 =	
44.	57 – 9 =	

Name _____ Date _____

1. Solve each problem using vertical form. Show the subtraction on the place value chart with chips. Exchange 1 ten for 10 ones, when necessary.

a. 173 – 42

hundreds	tens	ones

b. 173 – 38

hundreds	tens	ones

c. 170 – 44

hundreds	tens	ones

d. 150 – 19

hundreds	tens	ones

e. 186 – 57

hundreds	tens	ones

2. Solve the following problems without using a place value chart.

a. 73 – 56	b. 170 – 53

Name _____ Date _____

Solve using vertical form. Show the subtraction on a place value chart with chips. Exchange 1 ten for 10 ones, when necessary.

1. 164 – 49

hundreds	tens	ones

2. 181 – 73

hundreds	tens	ones

Name _____ Date _____

1. Solve each problem using vertical form. Show the subtraction on the place value chart with chips. Exchange 1 ten for 10 ones, when necessary.

a. 153 – 31

hundreds	tens	ones

b. 153 – 38

hundreds	tens	ones

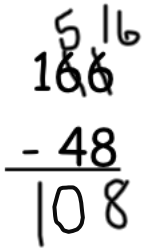
c. 160 – 37

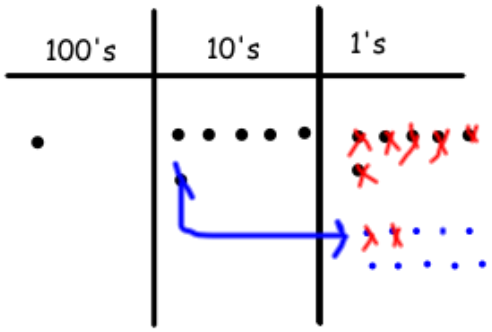
hundreds	tens	ones

d. 182 – 59

hundreds	tens	ones

2. Lisa solved 166 – 48 vertically and on her place value chart. Explain what Lisa did correctly and what she needs to fix.





a. Lisa correctly _____

_____

b. Lisa needs to fix _____

_____