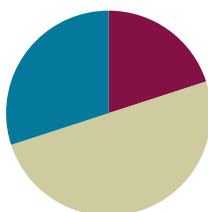


Lesson 15

Objective: Explore a situation with more than 9 groups of ten.

Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Concept Development	(30 minutes)
■ Student Debrief	(18 minutes)
Total Time	(60 minutes)



Fluency Practice (12 minutes)

- Sprint: Expanded Notation **2.NBT.3** (8 minutes)
- Compare Numbers 0–99 Using $<$, $>$, $=$ **2.NBT.4** (4 minutes)

Sprint: Expanded Notation (8 minutes)

Materials: (S) Expanded Notation Sprint

Compare Numbers 0–99 Using $<$, $>$, $=$ (4 minutes)

Materials: (T) 1 set of pre-cut $<$, $>$, $=$ symbols (Template 1)
 (S) Baggie containing 2 sets of pre-cut digit cards 0–9 (Template 2) per student, 1 set of pre-cut $<$, $>$, $=$ symbol cards (Template 1) per pair

Students are seated in partners at their tables.

- T: Take the digit cards out of your baggie. Use the cards to build a number from 0–99. Take 10 seconds.
- T: Compare numbers with your partner. Place the appropriate symbol (show $<$, $>$, $=$) between them.
- T: Read your number sentence to your partner using the words *greater than*, *less than*, or *equal to*. Then, use the language of units to explain how you know the number sentence is true.
- T: For example, you might say, “34 is less than 67. I know because 3 tens is less than 6 tens.” Go.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students compared numbers and used the symbols $<$, $>$, $=$ in Grade 1, but this activity is their first practice in Grade 2. The activity assumes student familiarity with the symbols $<$, $>$, $=$ and with this vocabulary: *compare*, *greater than*, *less than*, *equal to*, *tens*, and *ones*. This may not be the case, particularly if you have many English language learners. If necessary, modify the introduction to review symbols and vocabulary. Suggestion: Write and post vocabulary words. Create a sentence frame (e.g., is than) to help students use vocabulary. Ask pairs to identify the greater number and use the sentence frame to describe it. Do the same with the smaller number. Have students make or imagine that they have the same number as their partner. Ask them to whisper words they might use to compare the numbers. (*Equal* is a term that students are more likely to produce independently.) Instruct students to lay the appropriate symbols between numbers as they say the corresponding vocabulary words.

- S: 56 is greater than 23. 5 tens are greater than 2 tens.
 → 12 is less than 22 because 1 ten is less than 2. →
 79 is equal to 79. I know because the tens and ones
 are the same.
- T: Good. I'm holding our symbols face down. I'll flip one
 over and we'll read it to see which number wins this
 round. (Flip over a symbol and show it. This element
 of the game encourages students to diversify the
 numbers they make.)
- T: Who wins?
- S: Less than!
- T: Yes, the number that is *less than* wins this time.
- T: Let's play again. Players, use your digit cards to make
 another number.

Continue, following the same sequence.

Concept Development (30 minutes)

Materials: (S) Problem Set

Note: If a document camera is not available for the Student Debrief, give students poster board for Problem 4. Students need access to base ten materials (disks, bundles, and/or blocks) at centers. Do *not* place them at the tables or explicitly suggest that students use them. This is so that they learn to “use appropriate tools strategically” MP.5.)

- T: Let's read our 4 problems.
- S: (Read.)
- T: Partner A, without looking at the paper, retell the problems to your partner.
- T: Partner B, without looking at the paper, retell the problems, too.
- T: Your task in class today is to solve these “pencil problems” and record your thinking on paper so that you can share your solution strategies with another group.
- T: Before we begin, does anyone have any questions?
- S: How much time do we have?



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Group students carefully to balance strengths and language support. It often works well to pair an English language learner who has excellent conceptual understanding with a student who has very good language, but struggles with content. This pairing tends to foster supportive cooperation.

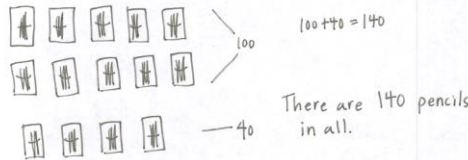
So that all students participate in articulating solutions, you may want to require that the group determine a different presenter for each problem. Groups must work together to make sure that each presenter is prepared to share the group's work.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 15 Problem Set 2•3

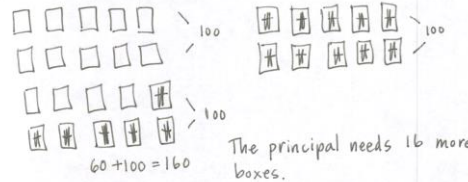
Names Jason and Hattie Date _____

Pencils come in boxes of 10.
There are 14 boxes.

1. How many pencils are there in all? Explain your answer using words, pictures, or numbers.



2. The principal wants to have 300 pencils for the second graders for October, November, and December. How many more boxes of pencils does he need? Explain your answer using words, pictures, or numbers.



COMMON CORE Lesson 15: Explore a situation with more than 9 groups of ten. Date: 5/13/14 engage^{ny} 3.E.54

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T: Good question. I will give you time signals. You have 20 minutes in all. I will tell you when you have 15, 10, and 5 minutes left.

T: Make sure to include a statement of your answers. You may begin!

MP.1

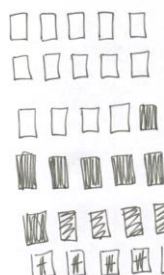
As the students work, circulate. This is their second extended exploration. You have been teaching many days consecutively. This is a day to stand back and observe them independently “making sense of a problem and persevering in solving it” (MP.1). Encourage pairs to ask other pairs for help rather than ask you.

Problem Set (20 minutes)

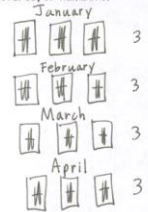
Students should do their personal best to complete the Problem Set within the allotted 20 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 15 Problem Set 2•3

3. The principal found 7 boxes in the supply closet and 4 boxes in a desk drawer. Now does he have what he wants for the second graders? Explain your answer using words, pictures, or numbers.

 The principal needs 5 more boxes.

4. How many boxes of pencils do you think your class will need for January, February, March and April? How many pencils is that? Explain your answer using words, pictures, or numbers.

 We need 30 pencils each month so that's 3 boxes. Altogether we need 12 boxes, or 120 pencils.

12 boxes = 120 pencils
10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120

COMMON CORE Lesson 15: Explore a situation with more than 9 groups of ten. Date: 5/13/14 engage^{ny} 3.E.55

Student Debrief (18 minutes)

Lesson Objective: Explore a situation with more than 9 groups of ten.

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.

T: Bring your work to our Debrief. Partners, find another group with whom to share your work just on Problems 1–3 for now. Explain your solution strategies.

S: (Share with each other.)

T: Let's go over the answers to Problems 1–3. Wait for the signal. Problem 1?

S: 140 pencils.

T: Please give the answer in a full statement, Jeremy.

S: There are 140 pencils in all.

T: Problem 2?

S: The principal needs 60 pencils.

T: What unit are we solving for?

S: Boxes.

- T: So, does 60 pencils answer the question?
- S: No.
- T: How many boxes does the principal need?
- S: 16 boxes.
- T: Problem 3. Does the principal have enough pencils?
- S: No!
- T: How do you know?
- S: He found 11 boxes in all. That's 110 pencils. 110 and 140 is less than 300. → He has 140 pencils. He found 70 and 40. That's 110. So, put those together you have 2 hundreds 5 tens, that's 250. Not enough. → You have 2 hundreds and then 10 and 40 is 50 so it's just 250 not 300. → He had 14 boxes. He found 11 boxes. That's 25 boxes but he needs 5 more to have 30 boxes.
- T: Good thinking. He does not have enough pencils. Let's show two different solutions.
- T: Now, let's share our work for Problem 4. (Possibly project the most concrete–pictorial work first which you feel best supports your mathematical objective.) Tell your partner what you see about how they solved the problem.
- T: (Allow one or two minutes before continuing.) Now, look at these students' work (show the second one down from the top.) Tell your partner what you see about how they solved the problem.
- T: (Allow them one or two minutes.) Did both groups get the same answer?
- S: No!
- T: Talk to your partner about why their answers are different and if both of them can be right.
- T: Do you think both of their answers make sense?
- S: Yes.
- T: Now, think about how each of them solved the problem.

Continue with the analysis of the student work. Get them to observe and analyze similarities and differences. The bottom paper is the most abstract solution. Ask the students to explain the mathematics.

Possibly have them follow up by writing a letter to the principal showing him their ideas and asking his thinking about the number of pencils to be ordered for their class for the four months. Have them run a sale or fund drive to make up the difference, assuming the principal was going to order less!

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.

A			# Correct _____		
Add.					
1	$20 + 1 =$		23	$400 + 20 + 5 =$	
2	$20 + 2 =$		24	$200 + 60 + 1 =$	
3	$20 + 3 =$		25	$200 + 1 =$	
4	$20 + 9 =$		26	$300 + 1 =$	
5	$30 + 9 =$		27	$400 + 1 =$	
6	$40 + 9 =$		28	$500 + 1 =$	
7	$80 + 9 =$		29	$700 + 1 =$	
8	$40 + 4 =$		30	$300 + 50 + 2 =$	
9	$50 + 5 =$		31	$300 + 2 =$	
10	$10 + 7 =$		32	$100 + 10 + 7 =$	
11	$20 + 5 =$		33	$100 + 7 =$	
12	$200 + 30 =$		34	$700 + 10 + 5 =$	
13	$300 + 40 =$		35	$700 + 5 =$	
14	$400 + 50 =$		36	$300 + 40 + 7 =$	
15	$500 + 60 =$		37	$300 + 7 =$	
16	$600 + 70$		38	$500 + 30 + 2 =$	
17	$700 + 80 =$		39	$500 + 2 =$	
18	$200 + 30 + 5 =$		40	$2 + 500 =$	
19	$300 + 40 + 5 =$		41	$2 + 600 =$	
20	$400 + 50 + 6 =$		42	$2 + 40 + 600 =$	
21	$500 + 60 + 7 =$		43	$3 + 10 + 700 =$	
22	$600 + 70 + 8 =$		44	$8 + 30 + 700 =$	

B		Improvement _____		# Correct _____	
Add.					
1	$10 + 1 =$		23	$500 + 30 + 6 =$	
2	$10 + 2 =$		24	$300 + 70 + 1 =$	
3	$10 + 3 =$		25	$300 + 1 =$	
4	$10 + 9 =$		26	$400 + 1 =$	
5	$20 + 9 =$		27	$500 + 1 =$	
6	$30 + 9 =$		28	$600 + 1 =$	
7	$70 + 9 =$		29	$900 + 1 =$	
8	$30 + 3 =$		30	$400 + 60 + 3 =$	
9	$40 + 4 =$		31	$400 + 3 =$	
10	$80 + 7 =$		32	$100 + 10 + 5 =$	
11	$90 + 5 =$		33	$100 + 5 =$	
12	$100 + 20 =$		34	$800 + 10 + 5 =$	
13	$200 + 30 =$		35	$800 + 5 =$	
14	$300 + 40 =$		36	$200 + 30 + 7 =$	
15	$400 + 50 =$		37	$200 + 7 =$	
16	$500 + 60 =$		38	$600 + 40 + 2 =$	
17	$600 + 70 =$		39	$600 + 2 =$	
18	$300 + 40 + 5 =$		40	$2 + 600 =$	
19	$400 + 50 + 6 =$		41	$3 + 600 =$	
20	$500 + 60 + 7 =$		42	$3 + 40 + 600 =$	
21	$600 + 70 + 8 =$		43	$5 + 10 + 800 =$	
22	$700 + 80 + 9 =$		44	$9 + 20 + 700 =$	

Names _____ and _____ Date _____

Pencils come in boxes of 10.

There are 14 boxes.

1. How many pencils are there in all? Explain your answer using words, pictures, or numbers.
2. The principal wants to have 300 pencils for the second-graders for October, November, and December. How many more boxes of pencils does he need? Explain your answer using words, pictures, or numbers.

3. The principal found 7 boxes in the supply closet and 4 boxes in a desk drawer. Now does he have what he wants for the second-graders? Explain your answer using words, pictures, or numbers.
4. How many boxes of pencils do you think your class will need for January, February, March, and April? How many pencils is that? Explain your answer using words, pictures, or numbers.

Name _____

Date _____

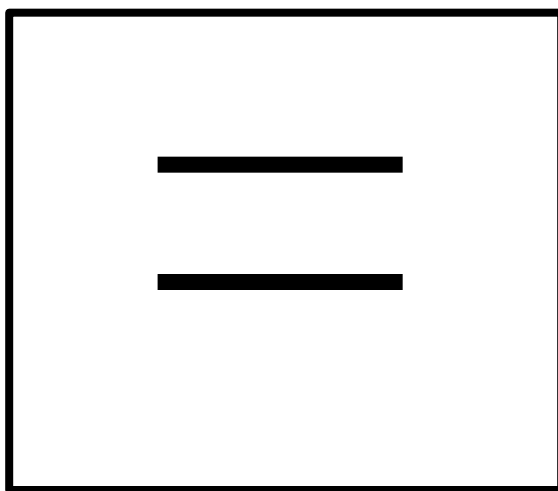
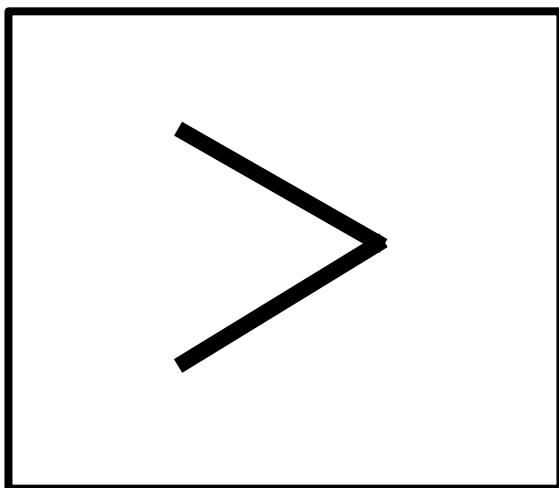
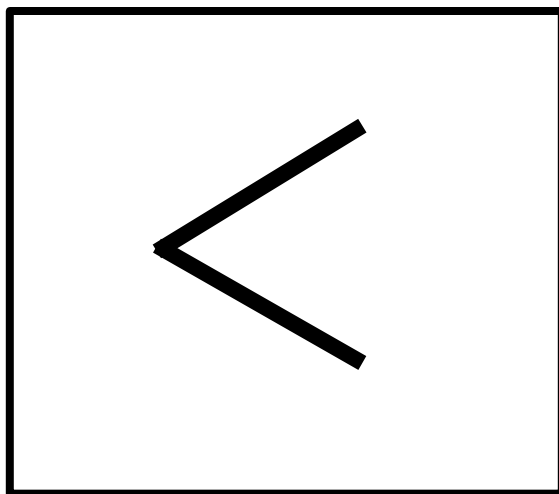
Think about the different strategies and tools your classmates used to answer the pencil question. Explain a strategy you liked that is different from yours using words, pictures, or numbers.

Name _____

Date _____

Pencils come in boxes of 10.

1. How many boxes should Erika buy if she needs 127 pencils?
2. How many pencils will Erika have left over after she gets what she needs out of the boxes?
3. How many more pencils does she need to have 200 pencils?



<, >, = symbol cards

0

1

2

3

4

5

6

7

8

9

digit cards 0–9