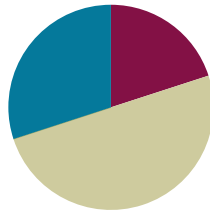


Lesson 15

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 $<$, $>$, $=$ comparison symbols (S) Baggie containing 2 sets of digit cards 0–9 per student and 1 personal white board with marker and 1 set of $<$, $>$, $=$ 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 ELL students. If necessary, modify the introduction to review symbols and vocabulary.

Suggestion: Write and post vocabulary words. Create a sentence frame (possibly: $\underline{\quad}$ is $\underline{\quad}$ than $\underline{\quad}$.) 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 (However, if you do not have a document camera for the Student Debrief, we suggest you give the students poster board for question 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: Students read.
- T: Partner A: Without looking at the paper, retell the problem to your partner.
- T: Partner B: Without looking at the paper, retell the problem, 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?
- T: Good question. I will give you time signals. You have 20 minutes in all. I will tell you when you 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.

Names: Freddy and Robin
 Date: _____
 Activity Worksheet Lesson 10: More than 9 Groups of Ten

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

1. How many pencils are there in all? Explain your thinking.

There are 140 pencils.

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 to get? Explain.

6 tens + 10 tens = 16 tens

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? Show how you know.

No he doesn't.

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 solve these problems using the RDW approach used for Application Problems.

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 questions 1–3 for now. Explain your solution strategies.
- S: (Share with each other.)
- T: Let’s go over the answers to questions 1–3. Wait for the signal, question 1?
- S: 140 pencils.

4. How many boxes of pencils do you think would be good for your class to have ready for January, February, March and April? How many pencils is that? Explain your thinking.

120 January
130 Feb.
110 March
140 April

400 10 tens

That is 500 pencils. That's 50 boxes

4. How many boxes of pencils do you think would be good for your class to have ready for January, February, March and April? How many pencils is that? Explain your thinking.

370 pencils.

J F M A

80 90 100 100

8 tens boxes 9 boxes 10 boxes 10 boxes

17 boxes 20 boxes

17 + 20 = 37

We think 37 boxes.

100, 200, 290
300 310 320 330 340 250 360 370

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

S: There are 140 pencils in all.

T: Question 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: Question 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 about question 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 1 or 2 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: (After giving them 1 or 2 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.

4. How many boxes of pencils do you think would be good for your class to have ready for January, February, March and April? How many pencils is that? Explain your thinking.

24 students

1 pencil every week

$$24 + 24 + 24 + 24$$

$$\begin{array}{r} 48 \\ 40 \quad 8 \end{array} \quad \begin{array}{r} 48 \\ 40 \quad 8 \end{array} = 80 + 16 = 96$$

$$96 + 96 + 96 + 96$$

$$\begin{array}{r} 100 \\ 100 \\ 100 \\ 100 \end{array} - \begin{array}{r} 4 \\ 4 \\ 4 \\ 4 \end{array} = 392$$

$$392 - 8 = 384$$

We think 384 pencils.
39 boxes would be good.

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	$9 + 20 + 700 =$	

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 would be good for your class to have ready 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.

