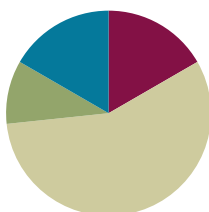


Lesson 5

Objective: Use the associative property to make a hundred in one addend.

Suggested Lesson Structure

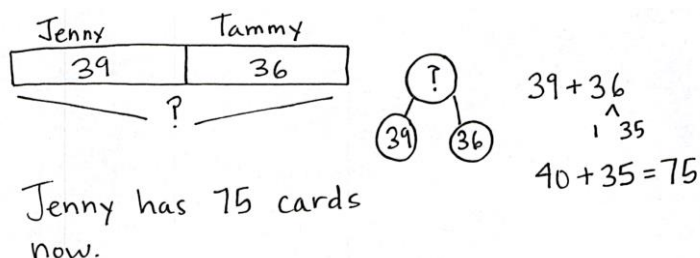
Application Problem	(6 minutes)
Fluency Practice	(10 minutes)
Concept Development	(34 minutes)
Student Debrief	(10 minutes)
Total Time	(60 minutes)



Application Problem (6 minutes)

Jenny had 39 collectible cards in her collection. Tammy gave her 36 more. How many collectible cards does Jenny have now?

Note: This problem is designed to provide a real life context for the skills the students have learned in previous lessons. Invite students to solve this problem using number bonds or any other simplifying strategy they have learned. After solving the problem, have students share their strategies with a partner.



Fluency Practice (10 minutes)

- Making the Next Hundred **2.NBT.5, 2.NBT.7** (4 minutes)
- Making the Next Hundred to Add **2.NBT.5, 2.NBT.7** (6 minutes)

Making the Next Hundred (4 minutes)

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

T: (Post $170 + \underline{\quad} = 200$ on the board.) Let's find missing parts to make the next hundred. I say 170, you say 30. Ready? 170.

S: 30.

T: Give the number sentence.

S: $170 + 30 = 200$.

Continue with the following possible sequence: 190, 160, 260, 270, 370, 380, 580, 620, 720, 740, 940, 194, 196, 216, 214, and 224.

Making the Next Hundred to Add (6 minutes)

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

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

S: 10 tens + 3 tens.

T: Answer in standard form?

S: 130.

T: $90 + 40$.

S: 130.

Post on board:

$$90 + 40 = \underline{\quad}$$

$$\begin{array}{r} \wedge \\ 10 \quad 30 \end{array}$$

$$90 + 10 = 100$$

$$100 + 30 = 130$$

Continue with the following possible sequence: 19 tens + 4 tens, 29 tens + 4 tens, 29 tens + 14 tens, 9 tens + 6 tens, 19 tens + 6 tens, 19 tens + 16 tens, 29 tens + 16 tens, 8 tens + 3 tens, 18 tens + 3 tens, 18 tens + 13 tens, 28 tens + 13 tens, 8 tens + 5 tens, 18 tens + 15 tens, and 28 tens + 15 tens.

Concept Development (34 minutes)

Materials: (S) Personal white board

Part 1: $17 + 13$, 17 tens + 13 tens, $170 + 130$, $170 + 40$

T: What is $17 + 12$?

S: 29.

T: What is $17 + 13$?

S: 30.

T: That was fast! How did you know?

S: I added 1 more to $17 + 12$. \rightarrow 13 is 1 more than 12, so the answer had to be 1 more than 29.

T: How many tens equal 17 tens plus 13 tens?

S: 30 tens.

T: What is the value of 30 tens?

S: 300.

T: What is $170 + 130$?

S: 300.

T: What happened when we added those numbers? Turn and talk.

S: We made a new hundred, just like when we added 17 to 13 and made a new ten. \rightarrow We composed a new hundred. \rightarrow Instead of 30 ones, we have 30 tens. It's just like $17 + 13$ except that the place value is different.

T: What is $17 + 14$? Write it on your personal white board, and turn it over, so I know when you're ready.

T: (Wait until students are ready.) Show me!

- S: (Show 31.)
 T: How many tens equal 17 tens plus 14 tens?
 S: 31 tens!
 T: $170 + 140$?
 S: 310.
 T: Talk with your partner. How did you know?
 S: 17 tens plus 14 tens is just like $17 + 14$, only in tens, so the answer is similar but in tens. $\rightarrow 170 + 140$ is 10 more than $170 + 130$, so the answer has to be 10 more. \rightarrow Since $170 + 130$ was 30 tens, I knew that $170 + 140$ had to be 31 tens. It's 1 more ten.

Extend to 17 tens + 15 tens, and continue until students are comfortable with the concept.



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

For students working above grade level, ask for alternative addition and subtraction number sentences that would have the same total (e.g., 32 tens or 320). Include number sentences with three addends.

- $\underline{\quad} + \underline{\quad} = 32$ tens
- 32 tens - $\underline{\quad} = \underline{\quad}$
- $\underline{\quad} + \underline{\quad} + \underline{\quad} = 320$

Part 2: Add multiples of 10 by making a hundred.

- T: In the past, we've used number bonds to make the next ten. Let's do it here, too, to make our adding easier when we have hundreds.
- T: (Write $190 + 120$ on the board.) Is one of these numbers close to the next hundred?
- S: Yes!
- T: Which one?
- S: 190.
- T: What is it close to?
- S: 200.
- T: How many more do we need to make 200?
- S: 10 more!
- T: Where can we get 10 more?
- S: From the 120.
- T: Great idea! Let's break apart 120 into 110 and 10. Now, we can add the 10 from 120 to the 190. And we know that 190 plus 10 equals 200. (Show number bond on the board.)
- T: What is our new addition problem? (Point to corresponding parts of the number bond.)
- S: $200 + 110$.
- T: Talk with a partner. What does this equal?
- S: 310. \rightarrow I did $200 + 100$ and added 10, so 310. \rightarrow I remembered what we did with tens, so I thought of $20 + 11$, which is 31, and 31 tens equals 310.
- T: I heard someone say she remembered what she did with the tens. Great! When we have a zero in the ones place, we can think of it as tens.
- T: How can we prove that $200 + 110$ is the same as $190 + 120$? Turn and talk.

$$\begin{array}{r}
 190 + 120 \\
 \swarrow \quad \searrow \\
 10 \quad 110 \\
 190 + 10 = 200 \\
 200 + 110 = 310
 \end{array}$$



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

For students who have trouble seeing that the two expressions, $190 + 120$ and $200 + 110$, are equivalent, show compensation using manipulatives, such as place value disks.

- S: I can add 100 to 190 and get 290, and then count 20 more by tens. So, that's 300, 310. → I can show both the arrow way, first adding hundreds, then tens. → I just know that since 190 is 10 less than 200, the other part has to be 10 more than 110. Then, the total will be equal. → I did it by using vertical form, and I got the same answer.

Have students solve the following problems on their personal white boards with a partner using number bonds: $190 + 160$, $430 + 180$, and $370 + 240$.

Part 3: Add three-digit numbers by making a hundred.

- T: So far, we've only been working with numbers that have zero in the ones place. Let's try something different now. (Write $199 + 25$ on the board.)
- T: What hundred is close to 199?
- S: 200.
- T: How far away is it?
- S: 1 away!
- T: Let's try decomposing 25 into 24 and 1. We can add the 1 from 25 to the 199. We know that 199 plus 1 equals 200. (Draw number bond.) What is our new addition problem?
- S: $200 + 24$.
- T: And, what is the total?
- S: 224.
- T: Let's try another example. (Write $295 + 78$ on the board.)
- T: I see one number that is close to some hundreds. Which number is that?
- S: 295.
- T: How far away is it?
- S: 5 away!
- T: Talk with a partner. How would you use a number bond to make a new, simpler number sentence?
- S: I could make 295 into 300 and have 73 left over. → I break 78 into 5 and 73, and then I give the 5 to 295, so $300 + 73$. → I get 300 and 73.
- T: (After student conversation, choose a volunteer to show the number bond and new number sentence on the board.) What is $300 + 73$?
- S: 373.
- T: Now, let's try one that has hundreds in both addends. (Write $535 + 397$ on the board.)
- T: Which number is closer to the next hundred?
- S: 397.
- T: With a partner, write the number bond and new addition problem. Then, solve it.
- S: I made $532 + 400$, so 932. → 397 is 3 away from 400, so I need to move 3 from the 535 to the 397. $400 + 532 = 932$. → Since I added 3 to 397, I had to take away 3 from 535. Now, it's easy to add 4 hundreds onto 532.

$$\begin{array}{r}
 199 + 25 \\
 \quad \swarrow \searrow \\
 \quad 1 \quad 24 \\
 199 + 1 = 200 \\
 200 + 24 = 224
 \end{array}$$

MP.7

Have students solve these problems on their personal white boards with a partner using number bonds: $299 + 22$, $495 + 30$, and $527 + 296$. As they complete the problems, they may begin work on the Problem Set.

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.

Student Debrief (10 minutes)

Lesson Objective: Use the associative property to make a hundred in one addend.

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.

- For Problem 1(c), 18 tens + 12 tens is the same as adding what two numbers? What is the value of 30 tens? How does (c) help you solve (d)?
- Share with a partner: How did you solve Problem 1(e)? How could you have used 1(e) to help you solve 1(f)? What would it look like to solve with a number bond? In Problem 2(b), $260 + 190$, how did you use a number bond to make a new, simpler addition problem? Which number did you break apart, or decompose? Why?
- In Problem 2(c), $330 + 180$, how did you extend your understanding of the make ten strategy? What do these strategies have in common? What is $330 + 180$ the Say Ten Way?
- For Problem 2(e), $199 + 86$, can you think of alternate strategies to solve? Do you think you could use disks and a place value chart? Why?

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 5 Problem Set 2•5

Name Fernanda Date _____

1. Solve.

a. 30 tens = 300

b. 43 tens = 430

c. 18 tens + 12 tens = 30 tens
 $18 + 12 = 30$

d. 18 tens + 13 tens = 31 tens
 $18 + 13 = 31$

e. 24 tens + 19 tens = 43 tens
 $24 + 19 = 43$

f. 25 tens + 29 tens = 54 tens
 $25 + 29 = 54$

2. Add by drawing a number bond to make a hundred. Write the simplified number sentence and solve.

a. $190 + 130$
 $10 \quad 120$
 $200 + 120 = 320$

b. $260 + 190$
 $260 \quad 10$
 $250 + 200 = 450$

c. $330 + 180$
 $310 \quad 20$
 $310 + 200 = 510$

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NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 5 Problem Set 2•5

d. $440 + 280$
 $60 \quad 220$
 $500 + 220 = 720$

e. $199 + 86$
 $1 \quad 85$
 $200 + 85 = 285$

f. $298 + 57$
 $2 \quad 55$
 $300 + 55 = 355$

g. $425 + 397$
 $422 \quad 3$
 $422 + 400 = 822$

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should we choose a number bond? Explain to your partner the steps you took to solve.

- What connections can you make between the number bond strategy and the arrow way? What is the goal of these strategies?

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.

Name _____

Date _____

1. Solve.

a. 30 tens = _____

b. 43 tens = _____

c. 18 tens + 12 tens = _____ tens

d. 18 tens + 13 tens = _____ tens

e. 24 tens + 19 tens = _____ tens

f. 25 tens + 29 tens = _____ tens

2. Add by drawing a number bond to make a hundred. Write the simplified number sentence and solve.

a. $190 + 130$



$$\underline{\hspace{2cm}} 200 + 120 \hspace{1cm} = \hspace{2cm}$$

b. $260 + 190$

$$\underline{\hspace{2cm}} = \hspace{2cm}$$

c. $330 + 180$

$$\underline{\hspace{2cm}} = \hspace{2cm}$$

d. $440 + 280$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

e. $199 + 86$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

f. $298 + 57$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

g. $425 + 397$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

Name _____

Date _____

1. Add by drawing a number bond to make a hundred. Write the simplified number sentence and solve.

a. $390 + 210$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

b. $798 + 57$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

2. Solve.

$$53 \text{ tens} + 38 \text{ tens} = \underline{\hspace{2cm}}$$

Name _____

Date _____

1. Solve.

a. 32 tens = _____

b. 52 tens = _____

c. 19 tens + 11 tens = _____ tens

d. 19 tens + 13 tens = _____ tens

e. 28 tens + 23 tens = _____ tens

f. 28 tens + 24 tens = _____ tens

2. Add by drawing a number bond to make a hundred. Write the simplified number sentence and solve.

a. $90 + 180$



$$\underline{100 + 170} = \underline{\hspace{2cm}}$$

b. $190 + 460$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

c. $540 + 280$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

d. $380 + 430$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

e. $99 + 141$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

f. $75 + 299$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

g. $795 + 156$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$