

# Unit 13 Number Sense: Addition Strategies

## Introduction

In this unit, students will explore different strategies to make addition within 100 easier, including adding and subtracting small amounts from each addend to bridge to the nearest 10; using tens and ones, regrouping when necessary; using the standard algorithm; and using doubles.

Teaching the next unit (Unit 14) about subtraction strategies immediately after this unit will help students to draw upon the connections between addition and subtraction.

## Meeting Your Curriculum

Alberta—All lessons in this unit are required except Lesson NS2-50. Lesson NS2-50 is recommended as it reviews Grade 1 material.

British Columbia—All lessons in this unit are required.

Manitoba—All lessons in this unit are required, except Lesson NS2-50. Lesson NS2-50 is recommended as it reviews Grade 1 material.

Ontario—All lessons in this unit are required, except Lesson NS2-50. Lesson NS2-50 is recommended as it reviews Grade 1 material.

## Recurring Games

The following games and activities recur throughout this unit.

**Picking Pairs.** Use decks of playing cards with the tens and face cards removed. Students can play in small groups, pairs, or individually. Place a 3 by 4 array of cards face up on the table. Students find pairs of cards that add to 10 and place them in the discard pile. When there are no more pairs in the array, more cards are added to it. The goal is to place all the cards into the discard pile. If students have any non-matching cards left at the end, then some of their cards must have been matched incorrectly.

**Memory.** Use decks of playing cards with the tens and face cards removed. Place a 3 by 4 array of cards face down on the table. Students turn over two cards at a time. Two cards match if they add to 10. If the cards match, students place these cards in the discard pile; otherwise, they turn them face down again and continue playing. Play this first as a whole class, with volunteers taking turns. Students can then play individually or co-operatively in pairs. In either case, the goal is to finish all the cards. If playing with a partner, Player 1 leads by choosing and turning over a card and Player 2 follows by choosing and turning over another card. After all pairs are found, players switch roles and play again.

**NOTE:** It is a good idea for students to play Picking Pairs—to practise making and recognizing matches—before they play Memory.

**Generic BLMs.** In addition to the BLMs found at the end of this unit, the following Generic BLMs, found in section Z, are also used in this unit:

**BLM Hundreds Chart** (p Z-1)

**BLM 1 cm Grid Paper** (p Z-3)

**Assessment.** The assessment checklist for this unit can be found in section AA. The following table indicates the lessons covered by quizzes and tests, which can be found in section BB.

Quiz	Lessons NS2-51 to 54
Quiz	Lessons NS2-55 to 58
Quiz	Lessons NS2-59 to 60
Test	Lessons NS2-51 to 60

# NS2-50 Patterns in Adding

Page 21

## CURRICULUM REQUIREMENT

AB: recommended  
BC: required  
MB: recommended  
ON: recommended

## VOCABULARY

addition sentence  
first  
last  
pair  
vertical line

## Goals

Students will discover ways to find all pairs of numbers that add to a given number.  
Students will use pictures and concrete materials to model addition.

## PRIOR KNOWLEDGE REQUIRED

Can draw models to add pairs of numbers  
Can solve missing addend problems

## MATERIALS

counters  
cups  
large blank cards

**Model addition sentences.** Write “ $3 + \underline{\quad} = 7$ ” on the board. SAY: Three plus something equals seven. Let’s draw circles to help us find the missing number. Draw seven circles on the board, arranged randomly. ASK: Why did we draw seven circles? (because 7 is the total in the number sentence) How can you use the circles to find the missing number? (colour three circles and count how many are not coloured; cross out three circles and count the ones that are left; circle a group of three circles and count how many are not part of the group) SAY: Those are all good ways. Today we will learn a different way. Erase the circles, and draw a row of seven circles underneath the number sentence, as shown below.

$$3 + \underline{\quad} = 7$$



ASK: What’s the first number you see in the number sentence? (3) What’s an easy way to choose three circles? (choose the first 3, or the last three) SAY: I could choose the first three or the last three, but I’m going to choose the first three. This way the “3” in the number sentence will line up with the group of 3 circles. ASK: How can we separate the first three circles from the others? (colour them; cross them out; circle them) SAY: Those are all good ways. Today, we will draw a line to separate the circles into groups. Draw a line after the first three circles, as shown below:

$$3 + \underline{\quad} = 7$$



SAY: The first three circles on the left side of the line (point to the first three circles) show us the first number in the number sentence (point to the 3). Point to the four circles to the right of the line and ASK: Which part of the

$$7 = \underline{0} + \underline{7}$$

$$7 = \underline{1} + \underline{6}$$

$$7 = \underline{2} + \underline{5}$$

$$7 = \underline{3} + \underline{4}$$

$$7 = \underline{4} + \underline{3}$$

$$7 = \underline{5} + \underline{2}$$

$$7 = \underline{6} + \underline{1}$$

$$7 = \underline{7} + \underline{0}$$



number sentence do these circles show? (the blank) How many circles are to the right of the line? (4) So, what is the missing number? (4)

**Write numbers in different ways.** Now tell students that you want to find all the ways of writing  $7 = \underline{\quad} + \underline{\quad}$ . Write the same addition sentence with blanks eight times on the board, all in a vertical column. ASK: What is the smallest number that can be put in the first blank? (0) Can there be no circles before the line? (yes) Draw a line before the first circle, and write “0” in the first blank. ASK: How many circles are after the line? (7) Then finish the addition sentence:  $7 = 0 + 7$ . Erase the vertical line. Continue in this fashion—ASK: What is the next number after 0? (1) Can there be one circle before the line? (yes)—until all eight addition sentences are complete, as shown in the margin. Point out how the line separating the circles moves one to the right each time. ASK: Have we found all the pairs that add to 7? (yes) Have we found all the ways of writing  $7 = \underline{\quad} + \underline{\quad}$ ? (yes) How do you know that we didn’t miss any? (because we wrote the numbers in order)

**Discuss how the different addition sentences are related.** ASK: What number is the same in each addition sentence? (the total) How do the other numbers change each time? What happens to the first number? (goes up by 1) What happens to the second number? (goes down by 1) Show seven counters and ask for a volunteer. Write on the board:

$$\text{Volunteer's counters} + \text{My counters} = 7 \text{ counters}$$

ASK: How many counters does the volunteer have? (0) How many do I have? (7) How many are there in total? (7) Write “ $0 + 7 = 7$ ” on the board. Now give the volunteer a counter and repeat the questions. Emphasize that you did not change the total number of counters by giving one to the volunteer, but the number of your counters went down by 1 and the number of his or her counters went up by 1. Repeat until all counters are transferred. Discuss how useful it is to be organized: by giving the volunteer one at a time, you made sure you didn’t miss any numbers.

Write “ $8 = \underline{\quad} + \underline{\quad}$ ” nine times on the board, and ask students for strategies to fill in the blanks with all possible answers. Some students may suggest using a model or transferring counters. Use one of these methods—transferring counters or drawing circles and vertical lines—to fill in the blanks together as a class. SAY: Notice the pattern: from one addition sentence to the next, you add 1 to the first number and subtract 1 from the second number, and you don’t change the total number. Then challenge students to find all the ways of writing  $6 = \underline{\quad} + \underline{\quad}$  without transferring counters.

**Exercises:** Find six ways of writing  $5 = \underline{\quad} + \underline{\quad}$ .

**Answers:**  $5 = 0 + 5$ ,  $5 = 1 + 4$ ,  $5 = 2 + 3$ ,  $5 = 3 + 2$ ,  $5 = 4 + 1$ ,  $5 = 5 + 0$

**Bonus:** Find all ways of writing  $13 = \underline{\quad} + \underline{\quad}$ .

**Answers:**  $13 = 0 + 13$ ,  $13 = 1 + 12$ ,  $13 = 2 + 11$ ,  $13 = 3 + 10$ ,  $13 = 4 + 9$ ,  $13 = 5 + 8$ ,  $13 = 6 + 7$ ,  $13 = 7 + 6$ ,  $13 = 8 + 5$ ,  $13 = 9 + 4$ ,  $13 = 10 + 3$ ,  $13 = 11 + 2$ ,  $13 = 12 + 1$ ,  $13 = 13 + 0$

**Are all the addition sentences needed?** SAY: We know that order doesn't matter in addition. I see that some of the number sentences have the same numbers. Have volunteers erase one of each pair adding to 8 that is the same. Repeat for pairs adding to 7.

#### ACTIVITY 1 (Essential), ACTIVITY 2 (Optional)

1. **Counters in a Cup.** Students move counters into a cup, one at a time, and write the corresponding addition sentence (number in cup + number not in cup = total number).
2. Give each student a card to write a number sentence on. SAY: We want to find all the pairs of numbers that add to 19 (or however many students are present). All students stand to begin. Draw on the board two columns with the headings "Number Standing" and "Number Sitting." Write  $19 + 0 = 19$ . Then have students sit down one at a time. As each student sits down, the student writes the corresponding number sentence on their card. When finished, collect all the cards and display them.

### Extensions

1. a) Amir tries to find all ways of writing  $9 = \underline{\quad} + \underline{\quad}$ . He always writes the bigger number first. Which addition sentence did he miss?

$$9 = 8 + 1 \qquad 9 = 5 + 4 \qquad 9 = 6 + 3 \qquad 9 = 9 + 0$$

- b) Zara tries to find all ways of writing  $15 = \underline{\quad} + \underline{\quad}$ . She always writes the bigger number first. Which addition sentence did she miss?

$$\begin{array}{llll} 15 = 14 + 1 & 15 = 12 + 3 & 15 = 10 + 5 & 15 = 8 + 7 \\ 15 = 13 + 2 & 15 = 11 + 4 & 15 = 9 + 6 & \end{array}$$

- c) Clara tries to find all ways of writing  $19 = \underline{\quad} + \underline{\quad}$ . She always writes the bigger number first. Which addition sentence did she miss?

$$\begin{array}{lll} 19 = 10 + 9 & 19 = 19 + 0 & 19 = 11 + 8 \\ 19 = 17 + 2 & 19 = 12 + 7 & 19 = 16 + 3 \\ 19 = 13 + 6 & 19 = 15 + 4 & 19 = 14 + 5 \end{array}$$

**Answers:** a)  $9 = 7 + 2$ , b)  $15 = 15 + 0$ , c)  $19 = 18 + 1$

2. a) Find the number of addition sentences you can write to make each number.

Total	Addition Sentences	Number of Sentences
0	$0 = 0 + 0$	1
1	$1 = 0 + 1$ $1 = 1 + 0$	2
2	$2 = \underline{0} + \underline{\quad}$ $2 = \underline{\quad} + \underline{\quad}$ $2 = \underline{\quad} + \underline{\quad}$	
3	$3 = \underline{0} + \underline{\quad}$ $3 = \underline{\quad} + \underline{\quad}$ $3 = \underline{\quad} + \underline{\quad}$ $3 = \underline{\quad} + \underline{\quad}$	

- b) Guess how many addition sentences you can write to make the number 4. Check to see if your guess is correct. Repeat with 5, 6, and 7.
- c) How can you find the number of addition sentences from the total?
- d) How many addition sentences can you write to make the number 50? Hint: Don't try to write all the sentences, use the pattern you found from part b).

### Answers

- a)  $2 = 0 + 2$ ,  $2 = 1 + 1$ ,  $2 = 2 + 0$ ; 3:  $3 = 0 + 3$ ,  $3 = 1 + 2$ ,  $3 = 2 + 1$ ;  $3 = 3 + 0$ ; 4
- b) 4: 5 sentences, 5: 6 sentences, 6: 7 sentences, 7: 8 sentences;
- c) the number of sentences is always 1 more than the number itself
- d) 51 sentences
3. a) Write all the addition sentences to make 5 that don't use the number 0. How many number sentences did you write?
- b) Repeat part a) for the numbers 6, 7, 8, 9, and 10.
- c) How can you find the number of sentences from the total?
- d) How many addition sentences can you write to make 80 that don't use the number 0?

Hint: Don't try to write all the sentences, just use the pattern you found from part b).

**Selected answers:** b)  $7 = 1 + 6$ ,  $7 = 2 + 5$ ,  $7 = 3 + 4$ ,  $7 = 4 + 3$ ,  $7 = 5 + 2$ ,  $7 = 6 + 1$ ; c) the number of sentences is always 1 less than the number itself; d) 79

4. Have students draw two rows of seven dots. Have students separate the first row with a line between two of the dots and then write a number sentence for the model. Then have students separate the second row in a different place and write a different number sentence. Show students how to combine the two sentences into one addition sentence. For example,  $3 + 4 = 7$  and  $2 + 5 = 7$  becomes  $3 + 4 = 2 + 5$ . Repeat with two rows of eight dots.

Working in pairs, one student draws two rows of the same number of dots, separated in different places, and then the other student writes an addition sentence combining both models. Partners switch roles and repeat. For an extra challenge, have partners combine three rows of dots.  
EXAMPLE:  $3 + 4 = 2 + 5 = 1 + 6$

**Pages 22–23**

AB: required  
BC: required  
MB: required  
ON: required

ones digit  
sum  
tens digit

Students will write numbers as a sum of tens and ones.

Can add within 100  
Knows the number of tens and ones in two-digit numbers

9 tens blocks and 9 ones blocks per student  
**BLM Hundreds Chart** (p Z-1)  
**BLM Tens Cards** (p Q-50)  
**BLM Ones Cards** (p Q-51)

**Answers:** a)  $23 = 10 + 10 + 1 + 1 + 1$ , b)  $14 = 10 + 1 + 1 + 1 + 1$ ,  
c)  $42 = 10 + 10 + 10 + 10 + 1 + 1$ , d)  $31 = 10 + 10 + 10 + 1$ ,  
Bonus:  $77 = 10 + 10 + 10 + 10 + 10 + 10 + 10 + 1 + 1 + 1 + 1 + 1 + 1 + 1$



Do the first exercise below together as a class, and then have students complete the remaining exercises individually.

**Exercises:** Write the number.

- |                                |                                 |
|--------------------------------|---------------------------------|
| a) 3 tens + 4 ones =           | b) 4 tens + 3 ones =            |
| c) 7 tens + 0 ones =           | d) 0 tens + 4 ones =            |
| e) $10 + 10 + 1 + 1 + 1 + 1 =$ | f) $10 + 10 + 10 + 1 + 1 + 1 =$ |
| g) $10 + 10 + 10 + 10 + 10 =$  | h) $1 + 1 + 1 + 1 =$            |

**Bonus**

$$10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 1 + 1 + 1 + 1 + 1 + 1 =$$

**Answers:** a) 34, b) 43, c) 70, d) 4, e) 24, f) 33, g) 50, h) 4, Bonus: 96

**Break numbers into their tens and ones.** ASK: How many tens are in 35? (3) What number is 3 tens? (30) How many ones are left? (5) Write “ $35 = 30 + 5$ ” on the board. Have students write various numbers in the same way. EXAMPLE:  $42 (= 40 + 2)$

**Exercises**

1. We can write  $32 = 30 + 2$ . Write the number in the same way.

- |         |         |         |         |
|---------|---------|---------|---------|
| a) 53 = | b) 28 = | c) 94 = | d) 81 = |
|---------|---------|---------|---------|

**Answers:** a)  $50 + 3$ , b)  $20 + 8$ , c)  $90 + 4$ , d)  $80 + 1$

2. Add.

- |                    |                    |
|--------------------|--------------------|
| a) $20 + 1 =$ ____ | b) $40 + 7 =$ ____ |
| c) $60 + 8 =$ ____ | d) $90 + 5 =$ ____ |
| e) $6 + 70 =$ ____ | f) $3 + 80 =$ ____ |

**Answers:** a) 21, b) 47, c) 68, d) 95, e) 76, f) 83

**Adding tens is like adding ones.** Have students work in pairs, where one partner has 9 ones blocks and the other has 9 tens blocks. Tell one partner to add  $5 + 2$  by grouping 5 ones blocks with 2 ones blocks and finding out how many ones blocks there are altogether. Tell the other partner to add  $50 + 20$  by grouping 5 tens blocks with 2 tens blocks and finding out how many tens blocks there are altogether. Ask each partner how many ones or tens they have. Are the answers the same? Why? Emphasize that students can find  $50 + 20$  by counting the number of tens ( $5 + 2$ ). Write on the board:

$$\begin{aligned}
 50 + 20 &= 5 \text{ tens} + 2 \text{ tens} \\
 &= \underbrace{10 + 10 + 10 + 10 + 10}_{5 \text{ tens}} + \underbrace{10 + 10}_{2 \text{ tens}} \\
 &= 7 \text{ tens} \\
 &= 70
 \end{aligned}$$

Repeat with other sums of tens. EXAMPLES:  $30 + 10$ ,  $40 + 20$ ,  $20 + 50$ . Do the following example, which omits the step of writing out the 10s. Write on the board:

$$\begin{aligned} 50 + 40 &= 5 \text{ tens} + 4 \text{ tens} \\ &= 9 \text{ tens} \\ &= 90 \end{aligned}$$

**Exercises:** Add.

- a)  $30 + 30$                       b)  $40 + 30$                       c)  $30 + 50$

**Answers:** 60, b) 70, c) 80

### ACTIVITY (Essential)

**A “card trick” for adding tens and ones.** Photocopy **BLM Tens Cards** onto blue paper and **BLM Ones Cards** onto red paper. Cut the cards out and give each student one set of blue cards (10 to 90) and one set of red cards (1 to 9). Show students how to add  $30 + 4$  using the cards. Find the blue card 30 and the red card 4. Then, place the 4 over the 0 on the tens card 30. What number do students see? (34) Repeat with various numbers. EXAMPLES:  $20 + 7$ ,  $40 + 5$ ,  $80 + 3$ ,  $30 + 8$ . Have students hold up their answers. Discuss why this works to add tens and ones. (By covering the 0 with the ones digit, you are showing the number of tens beside the number of ones. This is how we write numbers.)

## Extensions

- Show how to subtract tens.** For example, to calculate  $50 - 20$ , write  $50 = 10 + 10 + 10 + 10 + 10$ , then cross out 2 tens; that leaves 3 tens, so  $50 - 20 = 30$ . Have students try similar subtractions on their own. EXAMPLES:  $60 - 40$ ,  $30 - 10$ ,  $70 - 30$ .
- Show how to add hundreds.** SAY: Just as 10 is short for  $1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1$ , 100 is short for  $10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10$ . The number 200 means  $100 + 100$ . ASK: What does 300 mean? 500? 800? Continue with adding hundreds. EXAMPLE:  $500 + 300$ .
- BLM Switching Ones** (p Q-52) and **BLM Switching Tens** (p Q-53) teach students one application of separating tens and ones digits when adding—an extension of the commutative law. For example,  $13 + 5$  is the same as  $15 + 3$  because  $3 + 5 = 5 + 3$ . Furthermore, by switching the tens, students will see that  $36 + 20 = 26 + 30$  because  $3 + 2 = 2 + 3$  and so  $30 + 20 = 20 + 30$ .

Have students complete BLM Switching Ones.

**Answers:** 19,  $10 + 9$ , 19,  $10 + 9$ ; 29,  $20 + 9$ , 29,  $20 + 9$ ; 4, 6; 1, 3; 6, 5

Have students complete BLM Switching Tens.

**Answers:** 37,  $30 + 7$ , 37,  $30 + 7$ ; 86,  $80 + 6$ , 86,  $80 + 6$ ; 10, 10;  
10, 20; 20, 10

**Bonus:** Fill in the blank.

a)  $46 + 32 = 36 + \underline{\hspace{1cm}}$

b)  $34 + 25 = 35 + \underline{\hspace{1cm}}$

c)  $62 + 37 = 32 + \underline{\hspace{1cm}}$

d)  $45 + 12 = 42 + \underline{\hspace{1cm}}$

**Answers:** a) 42, b) 24, c) 67, d) 15

# NS2-52 Adding in Two Ways

Pages 24–27

## CURRICULUM REQUIREMENT

AB: required  
BC: required  
MB: required  
ON: required

## VOCABULARY

change  
first  
left  
opposite  
right  
second

## Goals

Students will learn to change addition sentences without changing the total.

## PRIOR KNOWLEDGE REQUIRED

Can write different models for the same sum

## MATERIALS

straw  
counters  
toothpicks

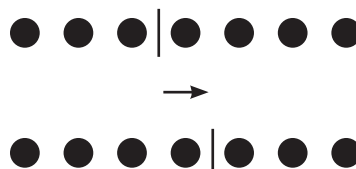
**Adding 1 to the first number and subtracting 1 from the second number doesn't change the sum.** Draw a row of seven dots with a line after the second dot; use a straw affixed to the board as the separating line.

ASK: What addition does this show? ( $2 + 5 = 7$ ) SAY: There are two dots before the line, five dots after the line, and seven dots altogether. I would like to move the line so that it shows  $3 + \underline{\quad} = \underline{\quad}$ . ASK: Which way should I move the line, left (point left) or right (point right)? (right) Explain that you need to move it one dot to the right so that there is one more dot before the line. Have a volunteer move the straw. SAY: There is now one more dot before the line. ASK: How did the number of dots after the line change? (it went down by 1) Did the total number of dots go up, go down, or stay the same? (it stayed the same) PROMPT: Did we add or take away any dots by moving the line? (no) ASK: What will the new number sentence be? ( $3 + 4 = 7$ ) Write on the board:

$$\begin{array}{rcccl} 2 & + & 5 & = & 7 \\ +1 \downarrow & & \downarrow -1 & & \\ 3 & + & 4 & = & 7 \end{array}$$

Pointing to the appropriate numbers on the board, SAY: The first number went up by one. The second number went down by one. The total stayed the same.

Challenge students to predict what the new number sentence will be when you move the line one dot to the right another time. ASK: Does the first number go up by 1 or down by 1? Will there be more or fewer dots before the line? (there will be one more dot before the line, so the first number goes up by 1) Demonstrate this:



$$\begin{array}{rcccl} 3 & + & 4 & = & 7 \\ +1 \downarrow & & \downarrow -1 & & \\ 4 & + & 3 & = & 7 \end{array}$$

Continue moving the line one dot to the right and emphasizing how the first number goes up by 1 and the second number goes down by 1. Tell students that this means the numbers are changing in opposite ways. Then, have students repeat the process with 8 dots. Start with the model for  $1 + 7 = 8$ , as shown below:



Students should record the number sentences at each stage.

**Practise finding another number sentence with the same answer.** Write “ $6 + 5 = 11$ ” on the board. SAY: If I add 1 to the first number and subtract 1 from the second number, I will still have a total of 11. Write “+1” under the 6 and “-1” under the 5, and complete the calculation to write the new number sentence:  $7 + 4 = 11$  (see margin). Have volunteers do the same for more sums. **EXAMPLES:**  $6 + 9 = 15$ ,  $5 + 11 = 16$ ,  $7 + 12 = 19$ .

$$\begin{array}{rclclcl}
 6 & + & 5 & = & 11 & \searrow \\
 +1 \downarrow & & \downarrow -1 & & & \\
 7 & + & 4 & = & 11 & 
 \end{array}$$

**Exercises:** Add and subtract 1 to make a new number sentence.

a)	$  \begin{array}{rclclcl}  9 & + & 7 & = & 16 \\  +1 \downarrow & & \downarrow -1 & & \\  \_ & + & \_ & = & \_  \end{array}  $	b)	$  \begin{array}{rclclcl}  8 & + & 9 & = & 17 \\  +1 \downarrow & & \downarrow -1 & & \\  \_ & + & \_ & = & \_  \end{array}  $
c)	$  \begin{array}{rclclcl}  4 & + & 11 & = & 15 \\  +1 \downarrow & & \downarrow -1 & & \\  \_ & + & \_ & = & \_  \end{array}  $	d)	$  \begin{array}{rclclcl}  5 & + & 12 & = & 17 \\  +1 \downarrow & & \downarrow -1 & & \\  \_ & + & \_ & = & \_  \end{array}  $

**Answers:** a)  $10 + 6 = 16$ , b)  $9 + 8 = 17$ , c)  $5 + 10 = 15$ , d)  $6 + 11 = 17$

**Add 1 to the second number and subtract 1 from the first number.** Repeat the lesson, but this time move the line left.

**Exercises:** Add and subtract 1 to make a new number sentence.

a)	$  \begin{array}{rclclcl}  9 & + & 7 & = & 16 \\  -1 \downarrow & & \downarrow +1 & & \\  \_ & + & \_ & = & \_  \end{array}  $	b)	$  \begin{array}{rclclcl}  8 & + & 9 & = & 17 \\  -1 \downarrow & & \downarrow +1 & & \\  \_ & + & \_ & = & \_  \end{array}  $
c)	$  \begin{array}{rclclcl}  4 & + & 11 & = & 15 \\  -1 \downarrow & & \downarrow +1 & & \\  \_ & + & \_ & = & \_  \end{array}  $	d)	$  \begin{array}{rclclcl}  5 & + & 12 & = & 17 \\  -1 \downarrow & & \downarrow +1 & & \\  \_ & + & \_ & = & \_  \end{array}  $

**Answers:** a)  $8 + 8 = 16$ , b)  $7 + 10 = 17$ , c)  $3 + 12 = 15$ , d)  $4 + 13 = 17$

**Doing the opposite to two numbers leaves their sum the same.** Repeat the lesson, but this time move the line two or more places left or right and discuss how each number changes or stays the same. Emphasize that the total stays the same and that the numbers being added are changing in opposite ways.

Write “ $5 + 4 = 9$ ” on the board. Tell students how to change the first number, and have them decide the correct way to change the second number so that the sum stays the same. Students should check their answer by finding both sums. EXAMPLES:

$$\begin{array}{lcl}
 1. & \begin{array}{c} 5 \\ +3 \downarrow \end{array} + \begin{array}{c} 4 \\ \downarrow \end{array} = 9 & \longrightarrow & \begin{array}{c} 5 \\ +3 \downarrow \end{array} + \begin{array}{c} 4 \\ \downarrow -3 \end{array} = 9 \\
 & & & \begin{array}{c} 8 \\ + \end{array} \begin{array}{c} 1 \\ \end{array} = 9 \\
 \\
 2. & \begin{array}{c} 5 \\ -3 \downarrow \end{array} + \begin{array}{c} 4 \\ \downarrow \end{array} = 9 & \longrightarrow & \begin{array}{c} 5 \\ -3 \downarrow \end{array} + \begin{array}{c} 4 \\ \downarrow +3 \end{array} = 9 \\
 & & & \begin{array}{c} 2 \\ + \end{array} \begin{array}{c} 7 \\ \end{array} = 9
 \end{array}$$

Repeat with similar examples.

**Exercises:** Change both numbers in opposite ways. Complete both addition sentences.

$$\begin{array}{lcl}
 a) & \begin{array}{c} 8 \\ +2 \downarrow \end{array} + \begin{array}{c} 6 \\ \downarrow \end{array} = \underline{\quad} & b) & \begin{array}{c} 8 \\ -1 \downarrow \end{array} + \begin{array}{c} 6 \\ \downarrow \end{array} = \underline{\quad} \\
 & \underline{\quad} + \underline{\quad} = \underline{\quad} & & \underline{\quad} + \underline{\quad} = \underline{\quad} \\
 \\
 c) & \begin{array}{c} 7 \\ +3 \downarrow \end{array} + \begin{array}{c} 9 \\ \downarrow \end{array} = \underline{\quad} & d) & \begin{array}{c} 13 \\ -3 \downarrow \end{array} + \begin{array}{c} 4 \\ \downarrow \end{array} = \underline{\quad} \\
 & \underline{\quad} + \underline{\quad} = \underline{\quad} & & \underline{\quad} + \underline{\quad} = \underline{\quad}
 \end{array}$$

**Answers:** a)  $8 + 6 = 14$ ,  $-2$ ,  $10 + 4 = 14$ ; b)  $8 + 6 = 14$ ,  $+1$ ,  $7 + 7 = 14$ ; c)  $7 + 9 = 16$ ,  $-3$ ,  $10 + 6 = 16$ ; d)  $13 + 4 = 17$ ,  $+3$ ,  $10 + 7 = 17$

## Extensions

- Ask students to find three numbers that add to 7. Challenge them to find as many ways as possible.

**Sample answer:**  $0 + 0 + 7 = 7$ ,  $0 + 1 + 6 = 7$ ,  $0 + 2 + 5 = 7$ ,  
 $0 + 3 + 4 = 7$ ,  $1 + 1 + 5 = 7$ ,  $1 + 2 + 4 = 7$ ,  $1 + 3 + 3 = 7$ ,  
 $2 + 2 + 3 = 7$

Repeat for other numbers.

- What would you take away from the third number to keep the sum the same? Explain. Complete the addition sentences.

$$\begin{array}{lcl}
 a) & \begin{array}{c} 4 \\ +2 \downarrow \end{array} + \begin{array}{c} 6 \\ +1 \downarrow \end{array} + \begin{array}{c} 5 \\ \downarrow \end{array} = \underline{\quad} \\
 & \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}
 \end{array}$$

$$\begin{array}{rclclclclcl}
 \text{b)} & 7 & + & 6 & + & 5 & = & \underline{\hspace{1cm}} \\
 & \downarrow & & \downarrow & & \downarrow & & \\
 & +2 & & +2 & & & & \\
 & \underline{\hspace{1cm}} & + & \underline{\hspace{1cm}} & + & \underline{\hspace{1cm}} & = & \underline{\hspace{1cm}}
 \end{array}$$

### Answers

a) Since  $2 + 1 = 3$ , you need to take away 3 from 5.  $4 + 6 + 5 = 15$ ,  
 $6 + 7 + 2 = 15$

b) Since  $2 + 2 = 4$ , you need to take away 4 from 5.  $7 + 6 + 5 = 18$ ,  
 $9 + 8 + 1 = 18$

3. Add and subtract 10 to make a new number sentence.

$$\begin{array}{rclclclclcl}
 \text{a)} & 40 & + & 30 & & = & \underline{\hspace{1cm}} \\
 & \downarrow & & \downarrow & & & & \\
 & +10 & & & & & & \\
 & \underline{\hspace{1cm}} & + & \underline{\hspace{1cm}} & & = & \underline{\hspace{1cm}} \\
 \\
 \text{b)} & 50 & + & 40 & & = & \underline{\hspace{1cm}} \\
 & \downarrow & & \downarrow & & & & \\
 & +10 & & & & & & \\
 & \underline{\hspace{1cm}} & + & \underline{\hspace{1cm}} & & = & \underline{\hspace{1cm}} \\
 \\
 \text{c)} & 10 & + & 80 & & = & \underline{\hspace{1cm}} \\
 & \downarrow & & \downarrow & & & & \\
 & +10 & & & & & & \\
 & \underline{\hspace{1cm}} & + & \underline{\hspace{1cm}} & & = & \underline{\hspace{1cm}} \\
 \\
 \text{d)} & 60 & + & 20 & & = & \underline{\hspace{1cm}} \\
 & \downarrow & & \downarrow & & & & \\
 & +10 & & & & & & \\
 & \underline{\hspace{1cm}} & + & \underline{\hspace{1cm}} & & = & \underline{\hspace{1cm}}
 \end{array}$$

**Answers:** a) 70,  $-10$ ,  $30 + 40 = 70$ ; b) 90,  $-10$ ,  $60 + 30 = 90$ ;  
c) 90,  $-10$ ,  $20 + 70 = 90$ ; d) 80,  $-10$ ,  $70 + 10 = 80$

# NS2-53 Using 10 to Add

Pages 28–29

## CURRICULUM REQUIREMENT

AB: required  
BC: required  
MB: required  
ON: required

## VOCABULARY

addition sentence  
one-digit  
total

## Goals

Students will add 2 one-digit numbers that have a sum greater than 10 by first re-grouping to make 10.

## PRIOR KNOWLEDGE REQUIRED

Can count on from a one-digit number  
Can add within 20  
Understands that dividing a quantity into parts does not change the original quantity

## MATERIALS

**BLM Groups of 10** (pp Q-54–55)  
decks of playing cards

**Adding 10 is easier than adding one-digit numbers.** Write on the board:

$$7 + 8 = \quad 8 + 9 = \quad 6 + 8 = \quad 5 + 6 = \quad 7 + 5 =$$

Have students solve the additions mentally. Students can count on their fingers if they need to. Have volunteers write the answers, and then hide the above addition sentences.

Below the hidden addition sentences, write on the board:

$$10 + 5 = \quad 10 + 7 = \quad 10 + 4 = \quad 10 + 1 = \quad 10 + 2 =$$

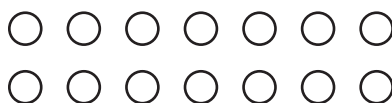
Have students solve the additions mentally, and have volunteers write the answers.

Uncover the hidden sentences. Discuss why adding a one-digit number to 10 is easier than adding any of the one-digit additions. (when adding a one-digit number to 10, the answer is just 1 followed by the one-digit number) Write on the board:

$$\begin{array}{ll} 10 + 1 & 10 + 6 \\ 10 + 2 & 10 + 7 \\ 10 + 3 & 10 + 8 \\ 10 + 4 & 10 + 9 \\ 10 + 5 & \end{array}$$

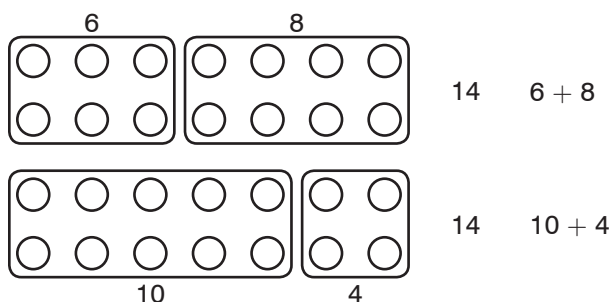
SAY: When you add  $10 + 1$ , you get 11. When you add  $10 + 2$ , you get 12. Have students continue saying the pattern up to  $10 + 9 = 19$ .

**The total is the same, no matter how you divide it into groups.** Draw on the board:





Have students count the circles with you—from top left to right, and then bottom left to right. ASK: How many circles are there? (14) Write “14” to the right of the circles. Draw and count a second set of 14 circles below the first set. ASK: How many circles are in this group? (14) Write “14” to the right of the second set. Draw circles to divide the top set into 6 and 8, and the bottom set into 10 and 4. ASK: Did breaking the top group into 6 and 8 and the bottom group into 10 and 4 change the total number of circles? (no) Write “ $6 + 8$ ” and “ $10 + 4$ .” The final picture should look like this:



Have students complete **BLM Groups of 10 (1)**.

**Answers:** 2, 2, 1, 3, 4

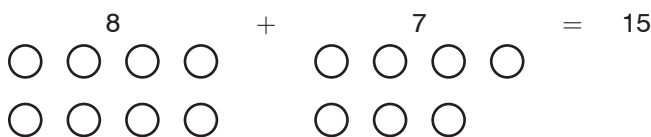
### ACTIVITIES 1–2 (Essential)

1. **Picking Pairs.** (see unit introduction)
2. **Memory.** (see unit introduction)

**Making a group of 10.** Draw on the board:

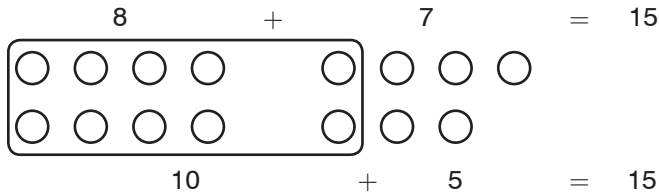


Have students count the groups of 8 and 7 circles. Write “8” and “7” above the groups. Write a plus sign, and have students count all the circles and say the total. (15) Write “= 15.” The picture should look like this:



Explain that there is an easier way to add 8 and 7. Group 10 circles by drawing a line around them. Have a volunteer count the 10 and then count the remaining circles and say how many there are. (5) Write “10” and “5” below the groups. ASK: Did making the group of 10 circles change the total? (no) SAY: Because grouping 10 circles didn’t change the total,  $8 + 7$  and  $10 + 5$  must both add to the same number. Write a plus sign. ASK: What is  $10 + 5$ ? (15) Write “= 15.”

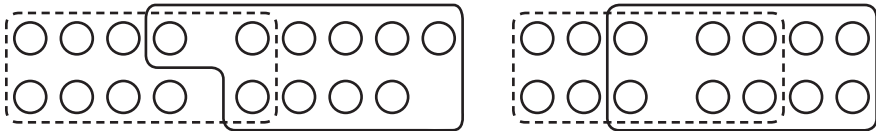
The final picture should look like this:



SAY: That means  $8 + 7$  is equal to  $10 + 5$ . Write on the board:

$$8 + 7 = 10 + 5$$

ASK: Which is easier to add:  $8 + 7$  or  $10 + 5$ ? Why? ( $10 + 5$ , because you only have to notice the 10 but count the 5; when you add  $8 + 7$ , you have to count both numbers) Explain that since  $10 + 5$  is easier to add than  $8 + 7$ , we are going to use that method. Repeat with  $8 + 9$  and  $6 + 8$ . Group each addition two ways to show that this doesn't change the answer, as shown in the sample below.



**Exercise:** Complete **BLM Groups of 10 (2)**.

**Answers:** 2, 2; 5, 5; 2, 2

## Extensions

- Have students complete **BLM Split to Make 10** (pp Q-56–57).

**NOTE:** Extensions 2 and 3 should be done in order.

- Make two groups of 10 to find the total. Write the addition sentence.



**Sample answers**



$$8 + 8 + 8 = 10 + 4 + 10 = 24$$



$$7 + 9 + 6 = 10 + 2 + 10 = 22$$

3. Draw a model to help you add.

a)  $9 + 7$

b)  $8 + 7$

c)  $5 + 9$

d)  $6 + 7 + 8$

e)  $5 + 6 + 9$

f)  $9 + 9 + 9$

**Sample answers:** a)  $9 + 7 = 10 + 6 = 16$ , b)  $8 + 7 = 10 + 5 = 15$ ,  
c)  $5 + 9 = 4 + 10 = 14$ , d)  $6 + 7 + 8 = 10 + 1 + 10 = 21$ ,  
e)  $5 + 6 + 9 = 10 + 0 + 10 = 20$ , f)  $9 + 9 + 9 = 10 + 7 + 10 = 27$

# NS2-54 Using the Nearest 10 to Add

Pages 30–33

## CURRICULUM REQUIREMENT

AB: required  
BC: required  
MB: required  
ON: required

## VOCABULARY

make 10

## Goals

Students will use pairs of numbers that add to 10 to make adding easier.

## PRIOR KNOWLEDGE REQUIRED

Knows pairs of numbers that add to 10  
Can complete addition problems when one addend is missing  
Can add 10 to a one- or two-digit number

## MATERIALS

coloured chalk or markers  
number cards for 1 to 9, three or four of each number  
decks of playing cards

**A grid model for adding using 10.** Review how to add  $8 + 6$  by drawing eight red circles and six blue circles. Find the answer by counting on from 8 circles as a class. Erase the board. SAY: I want to use a grid to make adding  $8 + 6$  easier. I am going to draw a long grid row of squares. I know that adding a number to 10 is easy, so I will mark a thick line after 10 squares. Draw on the board:



$$8 + 6 =$$

Have the class count aloud as you draw eight red circles and then six blue circles. The picture should look like this:



$$8 + 6 =$$

ASK: How many circles are before the thick line? (10) How do you know there are 10? (because there is 1 circle for each square, and we already know there are 10 squares before the thick line) How many circles after the line? (4) Write " $10 + 4 = \underline{\quad}$ " on the board, as shown below:



$$8 + 6 = 10 + 4 = \underline{\quad}$$

ASK: What is  $10 + 4$ ? (14) Write "14" in the blank. ASK: How did the picture make adding  $8 + 6$  easier? (the picture made it easy to change  $8 + 6$  into a problem where one number was 10; adding to 10 is easy)

Use the same method to solve several more addition problems as a class. EXAMPLES:  $9 + 6$ ,  $7 + 8$ ,  $8 + 5$ . Then, have students complete AP Book 2.2 p 30.

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**Review finding numbers that add to 10.** Tell students that it is important to be able to determine what makes 10 with the first number in an addition sentence, so that they can know what to subtract from the second number without using a picture. Have students practise finding what makes 10 with each number from 1 to 9. To start, write “ $10 = 1 + \underline{\quad}$ ” and “ $10 = 2 + \underline{\quad}$ ” on the board. Have students signal the answer by holding up the correct number of fingers. Continue the pattern of addition statements so that all the pairs adding to 10 are on the board. Give each student a number card from 1 to 9. Write a number on the board. Have all students who have the number that makes 10 with the number you wrote hold up their cards. Erase the answers on the board and repeat.

### ACTIVITIES 1–2 (Essential)

1. **Picking Pairs.** (see unit introduction)
2. **Memory.** (see unit introduction)

**Exercises:** What makes 10 with the first number? Subtract that amount from the second number. Use 10 to add.

- |  |  |  |
|--|--|--|
| a) $7 + 9 = 10 + \underline{\quad}$<br>$= \underline{\quad}$ | b) $7 + 6 = 10 + \underline{\quad}$<br>$= \underline{\quad}$ | c) $9 + 7 = 10 + \underline{\quad}$<br>$= \underline{\quad}$ |
| d) $8 + 6 = 10 + \underline{\quad}$<br>$= \underline{\quad}$ | e) $6 + 8 = 10 + \underline{\quad}$<br>$= \underline{\quad}$ | f) $6 + 7 = 10 + \underline{\quad}$<br>$= \underline{\quad}$ |
| g) $6 + 5 = 10 + \underline{\quad}$<br>$= \underline{\quad}$ | h) $9 + 6 = 10 + \underline{\quad}$<br>$= \underline{\quad}$ | i) $6 + 6 = 10 + \underline{\quad}$<br>$= \underline{\quad}$ |

**Answers:** a) 6, 16; b) 3, 13; c) 6, 16; d) 4, 14; e) 4, 14; f) 3, 13; g) 1, 11; h) 5, 15; i) 2, 12

**Make 10 with the second number instead of the first number.**

ASK: Which questions above have the same answer? Why did that happen? (sample answer:  $7 + 9$  and  $9 + 7$  because you are adding the same numbers) Which question was easier:  $7 + 9 = 10 + \underline{\quad}$  or  $9 + 7 = 10 + \underline{\quad}$ ? Why? (sample answer: students might find  $9 + 7$  easier because it is easier to do  $7 - 1$  than  $9 - 3$ )

Emphasize that it doesn’t matter whether they find what makes 10 with the first or the second number—they should just do what is easier. Write on the board:

- |                                     |                                     |
|-------------------------------------|-------------------------------------|
| a) $6 + 9 = 10 + \underline{\quad}$ | b) $4 + 8 = 10 + \underline{\quad}$ |
| c) $9 + 5 = 10 + \underline{\quad}$ | d) $7 + 6 = 10 + \underline{\quad}$ |

Have volunteers fill in the blanks by making 10 with the bigger number. Then, try the same problems by making 10 with the smaller number. ASK: Which way is easier? (making 10 with the bigger number because then you have to subtract less)

$$\begin{array}{r}
 +1 \quad 29 \quad + \quad 7 \quad -1 \\
 \downarrow \quad \quad \downarrow \\
 30 \quad + \quad 6 \\
 30 + 6 = 36 \\
 \text{so } 29 + 7 = 36
 \end{array}$$

SAY: By changing one of the numbers to 10, the problem becomes an easier problem with the same answer. Changing a problem into an easier problem with the same answer is a way mathematicians often use to solve problems.

**Add two-digit numbers by using tens.** Write “ $29 + 7$ ” on the board.

ASK: How can we make this question easier? Work through the answer with the class: Add 1 to 29 and subtract 1 from 7 (see margin). Write “ $30 + 6 = \underline{\quad}$ ” on the board. Have a volunteer fill in the blank. (36)

SAY:  $29 + 7$  is the same as  $30 + 6$ , which is 36. Repeat by adding more two-digit numbers ending in 9 to one-digit numbers. EXAMPLES:  $39 + 5$ ,  $6 + 79$ ,  $89 + 4$ .

**Exercises:** Add 1 to one of the numbers. Subtract 1 from the other number. Find the total.

a)  $49 + 5$

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

b)  $7 + 29$

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

c)  $6 + 59$

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

d)  $89 + 8$

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

**Answers:** a)  $50 + 4 = 54$ , b)  $6 + 30 = 36$ , c)  $5 + 60 = 65$ , d)  $90 + 7 = 97$

**Bridging up or down to the nearest 10.** Now, solve problems that involve changing 8 or 9 to 10, or subtracting 1 or 2 to make a multiple of 10. EXAMPLES:  $45 + 8 = 43 + 10 = 53$ ,  $52 + 7 = 50 + 9 = 59$ . Include problems where both numbers have two digits, such as:  $37 + 19 = 36 + 20 = 56$ ,  $46 + 28 = 44 + 30 = 74$ ,  $31 + 36 = 30 + 37 = 67$ . Have students decide which number to change to a 10. Students can signal the answer by pointing in the direction of the number that is easier to change to a 10.

**Exercises:** Make a new addition problem by adding and subtracting 1 or 2. Solve the new addition problem.

a)  $48 + 7$

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

b)  $7 + 31$

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

c)  $6 + 28$

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

d)  $79 + 6$

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

e)  $32 + 15$

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

f)  $71 + 27$

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

**Answers:** a)  $50 + 5 = 55$ , b)  $8 + 30 = 38$ , c)  $4 + 30 = 34$ , d)  $80 + 5 = 85$ , e)  $30 + 17 = 47$ , f)  $70 + 28 = 98$

## Extensions

1. Change the first number to make a 10. Write how much you will add or subtract. Change the second number in the opposite way. Solve the new addition problem.

a)  $47 + 9$

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

b)  $53 + 31$

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

c)  $8 + 28$

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

d)  $72 + 6$

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

e)  $31 + 15$

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

f)  $69 + 27$

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

### Answers

a) Add 3 to the first number.  $50 + 6 = 56$

b) Subtract 3 from the first number.  $50 + 34 = 84$

c) Add 2 to the first number.  $10 + 26 = 36$

d) Subtract 2 from the first number.  $70 + 8 = 78$

e) Subtract 1 from the first number.  $30 + 16 = 46$

f) Add 1 to the first number.  $70 + 26 = 96$

2. In Extension 1, when was it easier to add an amount to the first number? When was it easier to subtract an amount from the first number?

**Answer:** It was easier to add an amount to the first number when the ones digit in the first number was 7 or higher. It was easier to subtract an amount from the first number when the ones digit in the first number was 3 or lower.

3. Write " $4 + 9 = 10 + \underline{\quad} = \underline{\quad}$ " on the board. ASK: How do we change the 4 to make 10? (add 6) If we add 6 to 4, what do we need to subtract from 9? (6) What is  $9 - 6$ ? (3) Write "3" in the first blank, and then have a volunteer find the sum. (13) Then, tell students you will try another way to solve this problem. Write " $4 + 9 = \underline{\quad} + 10 = \underline{\quad}$ " on the board. ASK: How do we change the 9 to make 10? (add 1) If we add 1 to 9, what do we need to subtract from 4? (1) What is  $4 - 1$ ? (3) Write "3" in the first blank, and then have a volunteer find the sum. (13) ASK: Which way was easier to solve the problem, changing the 4 to make 10 or changing the 9 to make 10? (sample answer: changing the 9, because you just need to add and subtract 1) Have students find the following sums by using the nearest 10 to add. Remind students to choose which number they will change.

a)  $5 + 8 =$

b)  $16 + 37 =$

c)  $18 + 24 =$

d)  $36 + 49 =$

e)  $75 + 13 =$

f)  $25 + 59 =$

**Sample answers:** a)  $5 + 8 = 3 + 10 = 13$ , b)  $16 + 37 = 13 + 40 = 53$ ,  
c)  $18 + 24 = 20 + 22 = 42$ , d)  $36 + 49 = 35 + 50 = 85$ ,  
e)  $75 + 13 = 78 + 10 = 88$ , f)  $25 + 59 = 24 + 60 = 84$

4. Write “ $31 + 8 = 30 + \underline{\quad}$ ” on the board. ASK: To go from 31 to 30, did I add or subtract? (subtract) How much did I subtract? (1) Do I need to add 1 to 8 or subtract 1 from 8? (add 1) What number do I get? (9) Have a volunteer complete the problem on the board. ( $= 30 + 9 = 39$ ) Then, write “ $31 + 8 = \underline{\quad} + 10$ ” on the board and repeat the process. ( $= 29 + 10 = 39$ ) ASK: Which way was easier to solve the problem, changing the 31 to 30 or the 8 to 10? (answers will vary) Have students find two ways of solving each of the problems below.

a)  $49 + 22 =$

b)  $9 + 32 =$

c)  $18 + 39 =$

d)  $51 + 21 =$

## Answers

a)  $49 + 22 = 50 + 21 = 71$ ,  $49 + 22 = 51 + 20 = 71$

b)  $9 + 32 = 10 + 31 = 41$ ,  $9 + 32 = 11 + 30 = 41$

c)  $18 + 39 = 20 + 37 = 57$ ,  $18 + 39 = 17 + 40 = 57$

d)  $51 + 21 = 50 + 22 = 72$ ,  $51 + 21 = 52 + 20 = 72$

5. Solve the following problems without writing anything down. Add or subtract 1 or 2 from one of the numbers, and change the other number in the opposite way in your head.

a)  $9 + 6 =$

b)  $19 + 7 =$

c)  $5 + 29 =$

d)  $41 + 6 =$

e)  $52 + 6 =$

f)  $5 + 61 =$

**Selected sample solution:** a) (mentally) I add 1 to 9 to get 10, and I take away 1 from 6 to get 5, and 10 plus 5 is 15

**Answers:** b) 26, c) 34, d) 47, e) 58, f) 66



# NS2-55 Using Tens and Ones to Add

Pages 34–36

## CURRICULUM REQUIREMENT

AB: required  
BC: required  
MB: required  
ON: required

## VOCABULARY

altogether  
in total  
ones  
separate  
sum  
tens

## Goals

Students will separate tens and ones to add, first by drawing blocks and then by using a chart.

## PRIOR KNOWLEDGE REQUIRED

Knows how to add tens and ones  
Knows addition facts within 10

## MATERIALS

tens and ones blocks  
grid paper or **BLM 1 cm Grid Paper** (p Z-3)  
opaque bags  
transparency of **BLM 1 cm Grid Paper** (p Z-3, optional)  
overhead projector (optional)

**NOTE:** If students do not know their addition facts within 10, they will be frustrated trying to add two-digit numbers. Start with small tens and ones digits.

### Using tens and ones blocks to add two-digit numbers without regrouping.

Give students 9 tens blocks and 9 ones blocks. Write “16” on the board, and have students make 16 using the blocks. Tell them to set aside those blocks and then to make 13 with more blocks. Write on the board:  $16 + 13 = \underline{\quad}$ . Tell students to combine their two piles of blocks to find the sum. ASK: How many tens blocks do you have? Write “2 tens blocks” on the board. ASK: How many ones blocks do you have? Count them together and write “9 ones blocks” on the board. ASK: What number do you have in total? To guide students, write on the board:  $2 \text{ tens} + 9 \text{ ones} = \underline{\quad}$ . (29)

Show students how to draw tens and ones blocks on grid paper to represent the numbers (1 tens block and 6 ones blocks for 16, and 1 tens block and 3 ones blocks for 13). To draw a tens block, trace a row of ten small squares. Students can then count the small squares in a tens block to verify there are 10. Emphasize that now we can count the tens and ones blocks from the drawing; we don’t need actual tens and ones blocks. Again, there are 2 tens and 9 ones, so  $16 + 13 = 29$ . Count the small squares in the drawing to verify the addition.

Have volunteers draw tens and ones blocks to add more two-digit numbers. EXAMPLES:  $17 + 12$ ,  $11 + 16$ ,  $12 + 14$ ,  $13 + 15$

Give students grid paper or **BLM 1 cm Grid Paper** for the following exercises.

**Exercises:** Draw pictures of tens and ones blocks to add.

- |              |              |              |
|--------------|--------------|--------------|
| a) $43 + 25$ | b) $19 + 30$ | c) $27 + 32$ |
| d) $51 + 13$ | e) $42 + 5$  | f) $61 + 15$ |

**Answers:** a) 68, b) 49, c) 59, d) 64, e) 47, f) 76

### ACTIVITIES 1–2 (Optional)

1. Give each pair of students 9 tens blocks and 9 ones blocks in an opaque bag. One partner shakes the bag and then reaches in and blindly picks out 7 blocks. The other partner takes the remaining blocks. Have students write the numbers they get individually and then together add to find the total. Students switch roles and repeat. Then, ask volunteers to write the addition sentences they found.

Discuss the results as a class. ASK: Why is everyone getting a total of 99? Why are so many addition sentences different? Who had more blocks: the person who chose blindly or the person's partner? (the partner) Who had the greater number? Did the person with more blocks always get a bigger number? If so, challenge students to find a way that the person with more blocks can end up with a smaller number. If not, ASK: How is it possible that the person with more blocks, got a smaller number? (a tens block has more small squares than a ones block, so counting the number of blocks doesn't tell you the number of small squares)

2. Tell students that you have 3 tens blocks and 2 ones blocks in one hand and 4 tens blocks and 5 ones blocks in the other hand. Now, combine the piles and ask students to guess how many you have altogether. Take several guesses, then check by counting. Repeat several times with other numbers of blocks, but ensure that the addition problem never needs regrouping.

Then, have students play the game in pairs. Give each pair of students 9 tens blocks and 9 ones blocks. Player 1 takes some tens and some ones in one hand and some of each in the other hand, without using all the blocks. Player 1 tells Player 2 how many of each are in each hand, and Player 2 guesses how many of each there are altogether. Then, Player 1 combines them and counts.

**Review separating tens and ones, then adding tens and ones.** Have students show 34 with tens and ones blocks. Have a volunteer draw the tens and ones blocks on the board. Then, tell students that it is convenient to group the tens and ones separately. Group the 3 tens blocks from 34 and ASK: What number does this show? (30) Group the 4 ones blocks from 34 and ASK: What number does this show? (4) Write " $34 = 30 + 4$ ." Repeat with  $52 = 50 + 2$ .

### Exercises

1. Write as a sum of tens and ones.

a)  $58 = \underline{\quad} + \underline{\quad}$

b)  $62 = \underline{\quad} + \underline{\quad}$

c)  $73 = \underline{\quad} + \underline{\quad}$

d)  $23 = \underline{\quad} + \underline{\quad}$

### Bonus

e)  $90 = \underline{\quad} + \underline{\quad}$

f)  $9 = \underline{\quad} + \underline{\quad}$

**Answers:** a)  $50 + 8$ , b)  $60 + 2$ , c)  $70 + 3$ , d)  $20 + 3$ , e)  $90 + 0$ , f)  $0 + 9$

2. Add.

a)  $30 + 7 = \underline{\quad}$

b)  $60 + 8 = \underline{\quad}$

c)  $40 + 5 = \underline{\quad}$

d)  $70 + 1 = \underline{\quad}$

**Answers:** a) 37, b) 68, c) 45, d) 71

**Add by separating the tens and ones (no regrouping).** Write on the board:

$$\begin{array}{r} 34 \\ + 52 \\ \hline \end{array} = \begin{array}{r} 30 + 4 \\ 50 + 2 \\ \hline \end{array}$$

ASK: How many tens are there in 34? (3) In 52? (5) Altogether? (8) Write “80” underneath the  $30 + 50$ . SAY: 3 tens + 5 tens is 8 tens, 8 tens equals 80. ASK: How many ones are there? ( $4 + 2 = 6$ ) Write “6” below  $4 + 2$ . SAY: There are 8 tens and 6 ones. ASK: What number is that? (86) Write “86” below  $34 + 52$ . The final picture should look like this:

$$\begin{array}{r} 34 \\ + 52 \\ \hline 86 \end{array} = \begin{array}{r} 30 + 4 \\ 50 + 2 \\ \hline 80 + 6 \end{array}$$

**Connect the two methods.** Discuss how writing  $34 = 30 + 4$  is the same as drawing 3 tens blocks and 4 ones blocks (the 3 tens blocks represent 30 and the 4 ones blocks represent 4) and how it is different (it is less work to write  $30 + 4$  than to draw blocks).

**Add using a tens and ones chart (no regrouping).** Instead of writing 34 as  $30 + 4$ , now write it as 3 tens + 4 ones and show students how to fill in a tens and ones chart. Explain that we can add the tens and ones separately, just as we did before.

	tens	ones
34	3	4
+ 52	5	2

SAY: Now we can add the ones and tens. ASK: How many ones do we have? (6) How many tens? (8) Complete the chart by filling in the total. Have volunteers fill in similar charts. **EXAMPLES:**  $41 + 28$ ,  $55 + 32$ ,  $73 + 22$ .

Then, write  $57 + 21$  in a chart as shown below and have a volunteer fill in the total.

	tens	ones
	5	7
+	2	1

Repeat with questions written inside the chart. EXAMPLES:  $18 + 61$ ,  $37 + 22$ ,  $43 + 53$ .

Conclude by writing addition questions in vertical form without a chart, but use a grid (such as a transparency of BLM 1 cm Grid Paper). Have volunteers answer the following:

$$\begin{array}{r} 34 \\ + 52 \\ \hline \end{array}$$

$$\begin{array}{r} 64 \\ + 34 \\ \hline \end{array}$$

$$\begin{array}{r} 83 \\ + 13 \\ \hline \end{array}$$

$$\begin{array}{r} 23 \\ + 72 \\ \hline \end{array}$$

**Exercises: Add.**

a) 

5	6
2	1

b) 

3	5
2	4

c) 

1	7
7	1

d) 

4	5
3	3

e) 

6	3
2	4

**Answers:** a) 77, b) 59, c) 88, d) 78, e) 87

## Extensions

- Have students find the following sums by adding the columns one by one. **NOTE:** Although students have not learned how to read the large numbers below, they will be able to add them. Motivate students by emphasizing that they are adding very large numbers together.

a) 

5	1	6
2	8	2

b) 

3	4	7	5
2	2	1	4

c) 

2	3	4	5
7	5	3	1

d) 

6	9	1	3
2	0	8	4

**Bonus:**

5	4	7	9	8	6	3	2	1	5
2	2	1	0	1	2	5	6	4	4

**Answers:** a) 798, b) 5689, c) 9876, d) 8997, Bonus: 7 689 988 869

2. Write the number as a sum of tens and ones. Hint: There will be more than 9 tens.

a)  $108 = \underline{\hspace{1cm}} \text{ tens} + \underline{\hspace{1cm}} \text{ ones}$       b)  $271 = \underline{\hspace{1cm}} \text{ tens} + \underline{\hspace{1cm}} \text{ ones}$

c)  $918 = \underline{\hspace{1cm}} \text{ tens} + \underline{\hspace{1cm}} \text{ ones}$       d)  $153 = \underline{\hspace{1cm}} \text{ tens} + \underline{\hspace{1cm}} \text{ ones}$

**Answers:** a) 10, 8; b) 27, 1; c) 91, 8; d) 15, 3

3. Add.

a)  $5 \text{ ones} + 6 \text{ tens}$       b)  $7 \text{ tens} + 9 \text{ ones}$       c)  $8 \text{ tens} + 3 \text{ ones}$

d)  $4 \text{ ones} + 5 \text{ tens}$       e)  $0 \text{ tens} + 8 \text{ ones}$       f)  $0 \text{ ones} + 7 \text{ tens}$

**Bonus**

g)  $6 \text{ ones} + 17 \text{ tens}$       h)  $9 \text{ ones} + 39 \text{ tens}$       i)  $0 \text{ ones} + 90 \text{ tens}$

**Answers:** a) 65, b) 79, c) 83, d) 54, e) 8, f) 70, g) 176, h) 399, i) 900

4. Find the sum by adding the tens and ones separately.

a)  $23 + 42 + 14$       b)  $31 + 22 + 35$

c)  $21 + 23 + 31 + 14$       d)  $22 + 41 + 14 + 11 + 11$

**Answers:** a) 79, b) 88, c) 89, d) 79

# NS2-56 Many Ways to Write a Number

Pages 37–38

## CURRICULUM REQUIREMENT

AB: required  
BC: required  
MB: required  
ON: required

## VOCABULARY

hundreds chart  
ones  
T-table  
tens

## Goals

Students will show numbers using different combinations of tens and ones blocks. Students will make organized lists to show all the possible combinations.

## PRIOR KNOWLEDGE REQUIRED

Can find numbers on a hundreds chart  
Knows 10 ones blocks are equivalent to 1 tens block

## MATERIALS

tens and ones blocks  
transparency of **BLM Hundreds Chart** (p Z-1)  
overhead projector  
**BLM Many Ways to Write a Number** (p Q-58)  
**BLM Hundreds Chart** (p Z-1)  
rulers (optional)

**Trading tens blocks for ones blocks.** Give each student 6 tens blocks and 30 ones blocks. Have students make the number 28 using their blocks. (2 tens and 8 ones) Then, ask them to trade 1 tens block for 10 ones blocks. ASK: How many tens and ones blocks do you have now? (1 ten and 18 ones) Was it a fair trade? (yes) How do you know? (there are 10 ones in 1 tens block; verify this by counting) Can we say that you still have 28? (yes) How do you know? (it was a fair trade) Count the blocks to verify that students still have 28, by counting on from the 10 (11, 12, 13, ... , 28). Write “28 = 2 tens + 8 ones = 1 ten + 18 ones” on the board. Then, have students trade their last tens block for 10 more ones blocks. ASK: Now what do you have? (0 tens blocks and 28 ones blocks) Add “= 0 tens + 28 ones” to the expression on the board. Project a transparency of **BLM Hundreds Chart** on the board. Place tens and ones blocks on the overhead to show the various combinations that make 28. (see below)

$$28 = 2 \text{ tens} + 8 \text{ ones}$$

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

$$28 = 1 \text{ ten} + 18 \text{ ones}$$

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

28 = 28 ones

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

Have students complete **BLM Many Ways to Write a Number**. Explain that they might need to share ones blocks with a partner for some parts of the BLM. Emphasize to students that they can lay their tens and ones blocks on the hundreds chart provided on the BLM to help them answer the questions.

**Making an organized list.** Give each student a hundreds chart (e.g. from BLM Hundreds Chart) to use with tens blocks and ones blocks (each square in the chart should be 1 cm by 1 cm). Have students make the number 43 in as many ways as they can. Guide students to record their answers in an organized way, on a chart with headings “tens” and “ones.” ASK: Can you find a way to make sure you include all possible combinations? How many tens are in 43? (4) Start with 4 in the tens column and ASK: How many ones do I need to put in the ones column? (3) I want to make sure that I have all the possibilities—how can I make sure I don’t leave anything out? What other numbers can go in the tens column? Can I have 5 tens? 3 tens? 8 tens? 0 tens? (only 4 tens or less can be in the tens column because there are only 4 tens in 43) SAY: To make sure we write every possible number in the tens column, let’s write the numbers in order. Then, write the numbers from 4 to 0 in the tens column. ASK: If I have 3 tens, how many ones do I need to make 43? (13) Have students add this to their chart. Repeat for 2 tens, 1 ten, and 0 tens.

tens	ones
4	3
3	
2	
1	
0	



**Teach students to draw their own tables.** Show students how to draw a T-table, step by step, so they can draw their own tens and ones tables. First, draw the “T.” ASK: What letter in the alphabet does this look like? (the letter “t”) SAY: This is why we call it a T-table. Tell students that when they draw a table in their notebooks, they can use the lines on the page to draw the lines of the table. Write the headings “tens” and “ones” and draw lines for rows. (Make 3 rows under the tens and ones headings, even though you will need 4 rows.) Again, tell students they can use the lines on their notebook pages to draw the lines for rows. Show the students how to draw a border around the T-table to keep it nice and neat (and separate from other things on the board/page). You might provide rulers for students to help them make their lines straight. Then, write the number 36 above the table and as a class, complete the table. When you fill in the entry for the last row (1 ten, 26 ones), SAY: We need one more row. It’s easy to add a row to our table. Demonstrate how to add a row to the table by extending the lines, and then ask students what numbers to write for the last row. (0 tens, 36 ones)

Allow students to use tens blocks, ones blocks, and a hundreds chart if they wish for the following exercises.

**Exercises:** Copy the table. Write the number in many ways.

a) 23

tens	ones

b) 28

tens	ones

c) 49

tens	ones

d) 63

tens	ones

e) 58

tens	ones

f) 61

tens	ones

### Answers

a) 23

tens	ones
2	3
1	13
0	23

b) 28

tens	ones
2	8
1	18
0	28

c) 49

tens	ones
4	9
3	19
2	29
1	39
0	49

d) 63

tens	ones
6	3
5	13
4	23
3	33
2	43
1	53
0	63

e) 58

tens	ones
5	8
4	18
3	28
2	38
1	48
0	58

f) 61

tens	ones
6	1
5	11
4	21
3	31
2	41
1	51
0	61



## Extensions

1. Students will need 6 tens blocks and 30 ones blocks. Have students take 3 tens blocks and 12 ones blocks. ASK: What number do these blocks represent? (42) Suggest that students replace 10 ones blocks with 1 tens block until they have less than 10 ones blocks. This will make it easier to see the answer. Repeat with 4 tens blocks and 18 ones blocks (58), and then 2 tens blocks and 21 ones blocks (41). Then, have students identify the number for each combination of blocks in the following exercises, by trading ones blocks for tens blocks.
  - a) 3 tens blocks and 24 ones blocks
  - b) 5 tens blocks and 15 ones blocks
  - c) 27 ones blocks and 4 tens blocks
  - d) 30 ones blocks and 3 tens blocks

**Answers:** a) 54, b) 65, c) 67, d) 60

2. Rani finds the number represented in Extension 1.a) without using tens and ones blocks. She finds the tens digit of 24, which is 2. She adds that to the number of tens blocks:  $3 + 2 = 5$ . So she knows the number will have 5 tens. She finds the ones digit of 24, which is 4. She knows the number will have 5 tens and 4 ones, so she knows the number is 54.

Check that Rani's way works for parts b), c), and d) of Extension 1.

3. Have students design any shape or object they want using tens and ones blocks from their collection (i.e., 6 tens and 30 ones). ASK: How many tens blocks did you use? How many ones blocks? What number does that represent? Then, have students make another shape using a different number of blocks. Students can determine the numbers represented by other students' shapes.
4. Trade ones blocks for tens blocks. Find the number.
  - a) 1 tens block + 21 ones blocks + 2 tens blocks + 1 ones block
  - b) 9 ones blocks + 2 tens blocks + 6 ones blocks + 3 tens blocks
  - c) 17 ones blocks + 2 tens blocks + 9 ones blocks + 1 tens block

**Answers:** a) 52, b) 65, c) 56

# NS2-57 Regrouping

Pages 39–42

## CURRICULUM REQUIREMENT

AB: required  
BC: required  
MB: required  
ON: required

## VOCABULARY

trade  
regroup  
ones  
tens

## Goals

Students will add two-digit numbers by regrouping 10 ones for 1 ten.

## PRIOR KNOWLEDGE REQUIRED

Can decompose two-digit numbers into tens and ones  
Knows that the tens digit is the number of tens and the ones digit is the number of ones  
Can find the number that makes 10 with a given number  
Can add and subtract 10  
Can add single-digit numbers up to  $9 + 9$

## MATERIALS

tens and ones blocks  
overhead projector

**Review pairs that add to 10.** Tell students they will need to know the pairs that add to 10 for this lesson, so you will review them now. SAY: 10 equals 1 plus what? (9) Have students signal the answer by holding up the correct number of fingers. Repeat with all pairs of numbers adding to 10, several times.

Review adding one-digit numbers by regrouping to make 10. Write " $7 + 5 = 10 + \underline{\quad}$ " on the board. Then, use ones blocks on an overhead projector to represent the numbers 7 and 5. Move part of the second pile to the first to make the number 10. Line up 10 ones blocks to show that they are equal to 1 tens block. Write "2" in the blank. Provide each student with 8 tens block and 19 ones blocks (or students may share this number of blocks in pairs, taking turns to use them when needed). Students will need blocks for the following exercises and throughout the lesson.

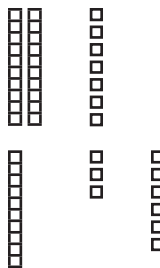
**Exercises:** Trade 10 ones blocks for 1 tens block. Use 10 to add.

- a)  $8 + 4 = 10 + \underline{\quad} = \underline{\quad}$       b)  $3 + 9 = \underline{\quad} + 10 = \underline{\quad}$   
c)  $9 + 7 = 10 + \underline{\quad} = \underline{\quad}$       d)  $6 + 8 = \underline{\quad} + 10 = \underline{\quad}$

**Answers:** a) 2, 12; b) 2, 12; c) 6, 16; d) 4, 14

**Adding two-digit numbers by regrouping.** Demonstrate  $27 + 19$  with tens and ones blocks on the overhead projector as shown on the following page.

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$$\begin{array}{r}
 27 = 20 + 7 \\
 + 19 = 10 + 3 + 6 \\
 \hline
 30 + 10 + 6
 \end{array}$$


SAY: For the number 19, I need 1 tens block and 9 ones blocks. I arranged the 9 ones blocks into two groups, of 3 and 6. ASK: How does that make it easier to find the final answer? (7 and 3 make 10) So, what is  $27 + 19$ ? (46)

**Exercises:** Use tens and ones blocks to add. Arrange the ones blocks into groups of tens to make adding easier.

- a)  $27 + 38$       b)  $16 + 45$       c)  $53 + 39$       d)  $25 + 66$

**Answers:** a) 65, b) 61, c) 92, d) 91

**Adding by separating tens and ones.** Tell students you will now add numbers without using tens and ones blocks, by separating the tens and ones. Write “ $46 + 28$ ” on the board vertically, and review with students how to separate each number into tens and ones and then add the tens and ones separately, as shown below:

$$\begin{array}{r}
 46 = 40 + 6 \\
 + 28 = 20 + 8 \\
 \hline
 60 + 14
 \end{array}$$

ASK: What is  $60 + 14$ ? (74) So, what is  $46 + 28$ ? (74) Draw an arrow and write “74,” as shown below:

$$\begin{array}{r}
 46 = 40 + 6 \\
 + 28 = 20 + 8 \\
 \hline
 74 \longleftarrow 60 + 14
 \end{array}$$

Have students copy and complete the following exercises.

**Exercises:** Separate the tens and ones to add. Find the final answer.

$$\begin{array}{r}
 \text{a) } \begin{array}{r} 37 = 30 + 7 \\ + 28 = 20 + 8 \\ \hline \end{array} \longleftarrow \qquad \text{b) } \begin{array}{r} 14 = 10 + 4 \\ + 47 = 40 + 7 \\ \hline \end{array} \longleftarrow \\
 \text{c) } \begin{array}{r} 52 = 50 + 2 \\ + 38 = 30 + 8 \\ \hline \end{array} \longleftarrow
 \end{array}$$

**Answers:** a)  $50 + 15$ , 65; b)  $50 + 11$ , 61; c)  $80 + 10$ , 90

**Regrouping tens and ones on charts.** Tell students that you have 3 tens blocks and 16 ones blocks. Show the two piles. Then, explain that you will trade 10 ones blocks for 1 tens block. SAY: This is called regrouping. Hide

the blocks while you do so. Have students predict how many tens and ones blocks you have now. Show the result of the trade to check their prediction. Record the result of the trade on a chart:

tens	ones
3	16
4	6

Repeat with similar problems, first showing how many of each type of block you have, then saying that you will trade 1 tens block for 10 ones blocks. EXAMPLES:

- 4 tens blocks and 12 ones blocks
- 2 tens blocks and 17 ones blocks
- 5 tens blocks and 14 ones blocks

Then, let students do the same in pairs with the Activity.

ACTIVITY (Essential)

Player 1 takes some tens and at least 10 ones and tells Player 2 how many blocks of each type he or she has, but doesn't show them; Player 2 trades a tens block for 10 of Player 1's ones blocks and predicts how many of each Player 1 has now. Players look at the blocks to verify the prediction and switch roles. Pairs will need 8 tens blocks and 19 ones blocks.

Show 3 tens blocks and 12 ones blocks and a tens and ones chart. SAY: 3 tens and 2 ones is 32. ASK: Is 3 tens and 12 ones 312? (no, the number of tens and ones must each be less than 10 to read the number this way) PROMPT: Do we say thirty-twelve? Remind students how we count up: 30, 31, 32, ... , 38, 39, 40 (not thirty-ten) SAY: When we have more than 10 ones blocks, we trade 10 of them for a tens block. That's why we don't say thirty-ten, we just say forty—thirty and 10 ones is the same as forty and 0 ones. Thirty and 12 ones is the same as forty and 2 ones; that's why we say forty-two, not thirty-twelve. Have a volunteer fill out the next row of the chart with the new tens and ones.

tens	ones
3	12

tens	ones
3	12
4	2

Allow students to use tens and ones blocks if they need to for the following exercises.

Exercises: Regroup in the next row.

- a)

tens	ones
4	17
- b)

tens	ones
3	13
- c)

tens	ones
6	11

**Answers:** a) 5, 7; b) 4, 3; c) 7, 1

**We stop trading ones for tens when we have fewer than 10 ones.** Show students that you have 4 tens blocks and 25 ones blocks. ASK: If I trade 10 ones blocks for a tens block, how many of each will I have? (1 more tens block is 5 tens blocks, and 10 fewer ones blocks is 15 ones blocks) Draw on the board:

tens	ones
4	25
5	15

SAY: There are still more than 10 ones, so we can keep trading. Have a volunteer finish the last row. (6, 5) Allow students to use tens and ones blocks if they need to for the following exercises.

**Exercises:** Regroup in the next row. Fill in the next row with the largest number of tens possible and the smallest number of ones possible. Hint: You will need to trade more than one group of tens.

a)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>3</td><td>28</td></tr><tr><td></td><td></td></tr></table>	tens	ones	3	28			b)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>2</td><td>24</td></tr><tr><td></td><td></td></tr></table>	tens	ones	2	24			c)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>5</td><td>32</td></tr><tr><td></td><td></td></tr></table>	tens	ones	5	32		
tens	ones																						
3	28																						
tens	ones																						
2	24																						
tens	ones																						
5	32																						

**Answers:** a) 5, 8; b) 4, 4; c) 8, 2

**Review adding using tens and ones charts (no regrouping).** Do the first exercise below as a class before having students complete the remaining exercises individually.

**Exercises:** Add by using the tens and ones chart.

a)

tens	ones
2	0
2	6

b)

tens	ones
4	0
1	7

c)

tens	ones
5	0
2	2

d)

tens	ones
3	4
2	5

**Answers:** a) 46, b) 57, c) 72, d) 59

**Adding using tens and ones charts (with regrouping).** SAY: Mathematicians like to turn harder problems, such as adding two-digit numbers, into easier ones, such as adding one-digit numbers. Display a tens and ones chart beside base ten materials again, showing the adding of the tens and ones, as shown on the following page.

$$\begin{array}{r} 27 \\ + 19 \\ \hline \end{array}$$

tens	ones
2	7
1	9
3	16
4	6

$$\begin{array}{l} 27 = 2 \text{ tens} + 7 \text{ ones} \\ + 19 = 1 \text{ ten} + 9 \text{ ones} \\ \hline 3 \text{ tens} + 16 \text{ ones} \\ 4 \text{ tens} + 6 \text{ ones} \end{array}$$

Guide volunteers to fill in the appropriate boxes in the chart. Add the tens and ones first, then regroup to find the answer. Notice that, before regrouping, students only had to add one-digit numbers to find the tens and ones in the answer.

Write “54 + 28” on the board. Draw the blank chart again, and ask volunteers to show 54 and 28 using tens and ones blocks. ASK: Where do I put the number of tens in 54? How many tens are there in 54? And so on. Demonstrate filling in the first two boxes. Then, have volunteers fill in the remaining boxes. Repeat with more two-digit additions that require regrouping. EXAMPLES: 36 + 37, 42 + 19, 17 + 44.

Extensions

1. Copy the tens and ones chart. Add the tens and ones first. Then regroup in the next row.

a)

	tens	ones
	2	0
	1	6
	1	9
+	2	6

b)

	tens	ones
	1	6
	2	6
	3	6
+	1	7

c)

	tens	ones
	1	8
	1	8
	1	8
+	1	8

d)

	tens	ones
	3	9
	1	9
	1	9
+	1	9

### Answers

a)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>2</td><td>0</td></tr><tr><td>1</td><td>6</td></tr><tr><td>1</td><td>9</td></tr><tr><td>2</td><td>6</td></tr><tr><td>6</td><td>21</td></tr><tr><td>8</td><td>1</td></tr></table>	tens	ones	2	0	1	6	1	9	2	6	6	21	8	1	b)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>1</td><td>6</td></tr><tr><td>2</td><td>6</td></tr><tr><td>3</td><td>6</td></tr><tr><td>1</td><td>7</td></tr><tr><td>7</td><td>25</td></tr><tr><td>9</td><td>5</td></tr></table>	tens	ones	1	6	2	6	3	6	1	7	7	25	9	5	c)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>1</td><td>8</td></tr><tr><td>1</td><td>8</td></tr><tr><td>1</td><td>8</td></tr><tr><td>1</td><td>8</td></tr><tr><td>4</td><td>32</td></tr><tr><td>7</td><td>2</td></tr></table>	tens	ones	1	8	1	8	1	8	1	8	4	32	7	2	d)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>3</td><td>9</td></tr><tr><td>1</td><td>9</td></tr><tr><td>1</td><td>9</td></tr><tr><td>1</td><td>9</td></tr><tr><td>6</td><td>36</td></tr><tr><td>9</td><td>6</td></tr></table>	tens	ones	3	9	1	9	1	9	1	9	6	36	9	6
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6	36																																																														
9	6																																																														

2. Draw a tens and ones chart to add the numbers. Add the tens and ones first. Then regroup in the next row. Hint: Read the numbers carefully!

- a) 3 tens and 2 ones  
+ 1 ten and 6 ones  
+ 2 tens and 7 ones
- b) 2 tens and 5 ones  
+ 1 ten and 6 ones  
+ 9 ones and 1 ten
- c) 9 ones and 3 tens  
+ 2 tens and 6 ones  
+ 7 ones and 1 ten

### Answers

a)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>3</td><td>2</td></tr><tr><td>1</td><td>6</td></tr><tr><td>2</td><td>7</td></tr><tr><td>6</td><td>15</td></tr><tr><td>7</td><td>5</td></tr></table>	tens	ones	3	2	1	6	2	7	6	15	7	5	b)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>2</td><td>5</td></tr><tr><td>4</td><td>6</td></tr><tr><td>1</td><td>9</td></tr><tr><td>7</td><td>20</td></tr><tr><td>9</td><td>0</td></tr></table>	tens	ones	2	5	4	6	1	9	7	20	9	0	c)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>3</td><td>9</td></tr><tr><td>2</td><td>6</td></tr><tr><td>1</td><td>7</td></tr><tr><td>6</td><td>22</td></tr><tr><td>8</td><td>2</td></tr></table>	tens	ones	3	9	2	6	1	7	6	22	8	2
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tens	ones																																								
3	9																																								
2	6																																								
1	7																																								
6	22																																								
8	2																																								

3. Zack tried to regroup. Explain the mistake that Zack made.

a)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>4</td><td>8</td></tr><tr><td>2</td><td>7</td></tr><tr><td>6</td><td>15</td></tr><tr><td>6</td><td>5</td></tr></table>	tens	ones	4	8	2	7	6	15	6	5	b)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>6</td><td>1</td></tr><tr><td>1</td><td>9</td></tr><tr><td>7</td><td>10</td></tr><tr><td>8</td><td>1</td></tr></table>	tens	ones	6	1	1	9	7	10	8	1	c)	<table><tr><th>tens</th><th>ones</th></tr><tr><td>3</td><td>9</td></tr><tr><td>1</td><td>8</td></tr><tr><td>4</td><td>17</td></tr><tr><td>41</td><td>7</td></tr></table>	tens	ones	3	9	1	8	4	17	41	7
tens	ones																																		
4	8																																		
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7	10																																		
8	1																																		
tens	ones																																		
3	9																																		
1	8																																		
4	17																																		
41	7																																		

### Sample answers

- a) There were 15 ones before regrouping. Ten of those ones should have been traded to make one more in the tens column. The final answer should be 75, not 65.
- b) There were 10 ones before regrouping. After trading the 10 ones for a ten, there should be 0 ones. The final answer should be 80, not 81.
- c) There were 17 ones before regrouping. 10 should have been traded to make one more in the tens column. The final answer should be 57, not 417.

# NS2-58 The Standard Algorithm for Addition

Pages 43–45

## CURRICULUM REQUIREMENT

AB: required  
BC: required  
MB: required  
ON: required

## VOCABULARY

column  
ones  
regroup  
sum  
tens

## Goals

Students will learn the standard algorithm for addition.

## PRIOR KNOWLEDGE REQUIRED

Can add tens digits and ones digits  
Can model a number using tens and ones blocks  
Can regroup ones as tens

## MATERIALS

dice  
**BLM Adding—Step 1** (p Q-59)

**Review adding with tens and ones charts.** Draw four blank tens and ones charts side by side, leaving plenty of room underneath, and have volunteers complete the charts for these questions (which require regrouping):

$$35 + 47 \quad 56 + 24 \quad 48 + 18 \quad 27 + 69$$

$$\begin{array}{r} 1 \\ 35 \\ + 47 \\ \hline 82 \end{array}$$

**Introduce the standard algorithm.** Do the first problem above using the standard algorithm underneath the tens and ones chart (see margin). Lead a class discussion. (Note that you do not need to teach students the words “standard algorithm.”) First, ensure that students understand where the numbers come from. ASK: How many ones are there in total? (12) How is that shown on the tens and ones chart? (we write the 12 under the 5 and 7) SAY: In the new way of adding, we write the 1 above the tens and the 2 under the 5 ones and 7 ones. Explain that 1 is the tens digit and 2 is the ones digit, so it makes sense to write the 1 in the tens column and the 2 in the ones column. ASK: How many tens are there in total? (8) How do you get that from the tens and ones chart—what numbers did you add? (the 3 and the 4) SAY: But 3 and 4 is only 7. ASK: How did I know to make it 8? (regroup 1 ten from the 12 ones, so add  $7 + 1 = 8$ ) How can you get the total number of tens from the new way of adding? (the 1 ten from the 12 ones is already regrouped, because it is already in the tens column, so we can add it right away:  $1 + 3 + 4 = 8$ ) Repeat with the second problem,  $56 + 24$ . Then, have volunteers write the two remaining sums using the standard algorithm, but write the question for them first (i.e., write one number above the other, with a line below and a plus sign on the left).

1. Add the ones.
2. Add the tens.
3. Regroup ten ones for a ten if necessary.



**Comparing the two methods.** Write the three steps of adding with a tens and ones chart on the board (see margin). Point out to students that the new way of adding just combines steps 2 and 3; it is just a shortcut for doing the same thing. For example, when finding the number of tens in the sum for the first question ( $35 + 47$ ), instead of doing  $3 + 4 = 7$  and then  $7 + 1 = 8$ , you do both together:  $3 + 4 + 1 = 8$ . ASK: Which two additions are combined in the second question? ( $5 + 2 = 7$  and  $7 + 1 = 8$  become

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5 + 2 + 1 = 8) Repeat for the third and fourth questions. (4 + 1 = 5 and 5 + 1 = 6 become 4 + 1 + 1 = 6; 2 + 6 = 8 and 8 + 1 = 9 become 2 + 6 + 1 = 9)

Remind students that they must add the ones first, to see if there is going to be an extra ten. SAY: It’s a bit tricky because you have to add from right to left instead of from left to right. Many students, even in grades 3 and 4, sometimes have trouble remembering to add from right to left because it is the opposite of the way we read in English (from left to right). That’s why it’s important to practise a lot!

**NOTE:** Some students may be overwhelmed by having to do both steps on AP Book 2.2 p 45. If this occurs, have them return to p 44 and practise doing only the second step: students write the number of tens in the grey boxes after having completed the first step for all the questions. Then, students can try doing both steps at the same time on p 45. When students finish, point out that the questions on p 45 (except for the right-most column) are the same as those on p 44, so students can check their answers using their answers from p 44.

EXTRA PRACTICE

BLM Adding—Step 1



Extensions

**NOTE:** The first three extensions in this lesson are similar to those in the previous lesson, except here, students use the standard algorithm. Students who do the corresponding extensions from both lessons will gain the added benefit of being able to compare the two methods (i.e., regrouping before adding in the tens column or after).

1. Add.

a)

2	0
1	6
1	9
+	2
	7

b)

1	6
2	8
3	6
+	1
	7

c)

1	8
1	8
1	7
+	1
	8

Answers

a)

2	
2	0
1	6
1	9
+	2
8	2

b)

2	
1	6
2	8
3	6
+	1
9	7

c)

3	
1	8
1	8
1	7
+	1
7	1

2. Provide students with grid paper or **BLM 1 cm Grid Paper** (p Z-3). Tell students that they need to write the numbers one above the other, making sure the ones digits are in the ones column and the tens digits are in the tens column, before doing the additions. Remind students to read the numbers carefully!

- a) 3 tens and 2 ones  
+ 1 ten and 6 ones  
+ 2 tens and 7 ones
- b) 2 tens and 5 ones  
+ 6 ones and 4 tens  
+ 9 ones and 1 ten
- c) 9 ones and 3 tens  
+ 2 tens and 6 ones  
+ 7 ones and 1 ten

### Answers

a) 

1	
3	2
1	6
2	7
7	5

, b) 

2	
2	5
4	6
1	9
9	0

, c) 

2	
3	9
2	6
1	7
8	2

3. Jin tried to add. Explain the mistake that Jin made.

a) 

4	8
2	7
6	5

, b) 

0	
6	1
1	9
8	1

, c) 

3	9
1	8
41	7

### Answers

- a) In the ones column,  $8 + 7 = 15$ . Jin forgot to carry the tens digit of 15 (1) into the tens column.
- b) In the ones column,  $1 + 9 = 10$ . Jin wrote the ones digit of 10 (0) in the tens column instead of the tens digit of 10 (1); he also left the 1 in the ones column instead of the 0.
- c) In the ones column,  $9 + 8 = 17$ . Instead of writing the tens digit of 17 (1) at the top of the tens column and adding  $(1 + 3 + 1 = 5)$ , he wrote the 1 after adding the other numbers in the tens column:  $3 + 1 = 4$ ; Jin turned 4 into 41 instead of 5.
4. Students need a die and **BLM Addition Dice** (p Q-60). Students roll the die three times and record their rolls at the top of the BLM. Students then write the numbers they rolled in the boxes to create two-digit numbers that add to a number as close as possible to 90 and record the sum. Repeat, using the same rolls, to obtain a number as close as possible to 70, and then to 40. For example, if a student rolls 6, 5, and 2, they might arrange their numbers to create  $25 + 62 = 87$ ,  $26 + 52 = 78$ , and  $16 + 25 = 41$ .

# NS2-59 Doubles

Pages 46–47

## CURRICULUM REQUIREMENT

AB: required  
BC: required  
MB: required  
ON: required

## VOCABULARY

double  
rows  
skip counting

## Goals

Students will use various methods to double numbers.

## PRIOR KNOWLEDGE REQUIRED

Can skip count by 2s up to 20  
Can add 10 to a one-digit number

## MATERIALS

counters  
paper counters  
**BLM What Is the Double?** (p Q-61)

**Introduce “double.”** Write “double” on the board. ASK: Does anyone know what it means to double a number? (add the same number to the number you have) If I have three counters and I double the number of counters, how many will I have? Demonstrate counting out three counters and then three more. Explain that if you double a number, you add the same number again. Affix paper counters to the board to demonstrate this. Show two counters and SAY: I’m going to double my counters, so if I start with two, I need to add two more (affix two more counters to the board). ASK: How many do I have now? (4) Write “4 is the double of 2” on the board. Repeat with other examples, always emphasizing the word double and using pictures or concrete objects to illustrate the doubling.

**Doubling a number by creating 2 rows of the same number.** Affix a row of three paper counters on the board and write “3” beside it. Then, add another row underneath and ASK: How many are there now? Write “6 is the double of 3.” Repeat to double other numbers from 1 to 10.

Give each student 10 counters. Demonstrate how to solve the first exercise below before having students do the remaining exercises individually.

**Exercises:** Write an addition sentence for the double. Use counters to check.

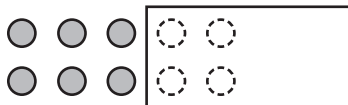
- a) the double of 4      b) the double of 1      c) the double of 3  
d) the double of 2      e) the double of 5      **Bonus:** the double of 0

**Answers:** a)  $4 + 4 = 8$ , b)  $1 + 1 = 2$ , c)  $3 + 3 = 6$ , d)  $2 + 2 = 4$ ,  
e)  $5 + 5 = 10$ , Bonus:  $0 + 0 = 0$



**Reading doubles from a chart.** Draw two rows of 1, 2, 3, 4 and 5 circles to illustrate doubling (see margin).

1 doubled	2 doubled
○	○ ○
○	○ ○
is 2	is 4

Now, use a piece of paper to cover up part of the two rows of 5 to show 3 doubled (emphasize that you are leaving three in each row uncovered):



ASK: What is 3 doubled? (6) Have a volunteer move the paper to show 2 doubled, 4 doubled, 1 doubled, and finally 5 doubled. Now, draw two rows of 7 circles and have volunteers show 3 doubled, 6 doubled, 5 doubled, and so on.

one row: 1 2 3 ... 7  
  
  
 two rows: 2 4 6 ... 14

#### EXTRA PRACTICE

#### BLM What Is the Double?

**Answers:** 8, 14, 0, 12; 2, 16, 4, 10, 18; 16, 10; 8, 14; 0, 18; 6, 4; 2, 12

**Skip counting by 2s to double.** Next, demonstrate counting the number in the top row (count by 1s) and the total number (count by 2s). ASK: When I count the total number in the two rows, how am I counting? (counting by 2s) ASK: Can you tell from this picture what the double of 4 is? Repeat for 6, 3, 7, 2, 5, and 1. Then demonstrate counting by 2s, using your fingers, to double 3—count by 2s until you have three fingers up. Connect to the chart above: hold up one finger at a time as you skip count and point to the number in the first row. As a class, find the doubles of numbers up to 10 using this method.

## Extensions

1. Have students complete **BLM Doubles (1)** (p Q-62).

**Answers:** 4, 40; 4, 40; 8, 80; 10, 100

Have students complete **BLM Doubles (2)** (p Q-63).

**Answers:**  $30 + 4, 60 + 8 = 68$ ;  $40 + 5, 80 + 10 = 90$ ;  
 $30 + 2, 60 + 4 = 64$ ; 4, 54; 8, 16, 6, 76; 52;  $40 + 9, 80 + 18 = 98$

#### CONNECTION



Measurement

2. Have students complete **BLM Big Cubes and Centimetres** (p Q-64). Students will need centimetre rulers and 2 cm connecting cubes.

**Answers:** 4, 8; 2, 4; 5, 10; double, 28

3. Challenge students to double numbers in different ways, including by subtraction, and to verify that they get the same answer.  
 EXAMPLE:  $7 = 5 + 2$  so 7 doubled is  $10 + 4 = 14$ , but  $7 = 10 - 3$  so 7 doubled is also  $20 - 6 = 14$ .

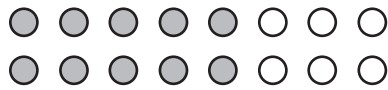
#### CONNECTION



Measurement

4. **Halfway around a rectangle.** Draw a rectangle on a grid, such as a transparency of **BLM 1 cm Grid Paper** (p Z-3). ASK: Where is halfway around the rectangle? (one short side plus one long side) Have students find half the distance around and then double their answers to find the total distance around the rectangle. Draw various rectangles on a grid. You may highlight one length (long side) and one width (short side) at the beginning. EXAMPLES: 2 squares by 3 squares, 3 squares by 4 squares, 5 squares by 5 squares.

5. **Using 5 to double.** Tell students you want to double the number 8 in a different way. Show 8 as 5 coloured circles and 3 blank circles. Then, double the circles by drawing a second identical row. Emphasize that the two rows of 5 coloured circles is 10 circles and the two rows of 3 blank circles is 6 circles, so 8 doubled is  $10 + 6 = 16$ .



8 is  $5 + 3$ ,  
so 8 doubled is  $10 + 6 = 16$

ASK: Why is adding  $10 + 6$  easier than adding  $8 + 8$ ? (because adding 10 is always easy) Explain that because 10 is the double of 5, it is easier to double numbers when we split the number into 5 plus another number. Double more numbers using the model. Then double some numbers using just the numbers, without the model. EXAMPLE:  $6 = 5 + 1$ , so  $6 + 6 = 10 + 2 = 12$ . Have students double more numbers this way.

Have students complete **BLM Finding Doubles Using 5** (p Q-65).

**Answers:**  $10 + 4 = 14$ ; 4,  $10 + 8 = 18$ ; 5,  $10 + 10 = 20$ ; 1,  $10 + 2 = 12$

**Bonus:** Find the double of 13. (use  $13 = 5 + 8$  to get  $10 + 16 = 26$ , or use  $13 = 10 + 3$  to get  $20 + 6 = 26$ )

# NS2-60 Using Doubles to Add

Pages 48–50

## CURRICULUM REQUIREMENT

AB: required  
BC: required  
MB: required  
ON: required

## VOCABULARY

double  
less than  
more than  
sum

## EXAMPLES:

$$7 + \underline{\quad} = 10$$

$$6 + \underline{\quad} = 10$$

$$8 + \underline{\quad} = 10$$

## Goals

Students will use doubles to add by using the concept of one more than or one less than.

## PRIOR KNOWLEDGE REQUIRED

Knows the doubles of numbers up to  $10 + 10$   
Can complete number sentences where one number is missing  
Can add 10 to a one-digit number  
Can solve addition sentences with three addends  
Can find one more than and one less than

## MATERIALS

counters



**Using one more or one less than pairs that add to 10.** Review pairs of numbers that add to 10 (see examples in margin). Then, have students decide whether the sum is one more than or one less than 10 by comparing to two numbers that add to 10:

$$5 + 6 \text{ is } \underline{\text{one more than}} \underline{\quad} 4 + 6 \text{ so } 5 + 6 = \underline{11}$$

$$8 + 3 \text{ is } \underline{\quad} 8 + 2 \text{ so } 8 + 3 = \underline{\quad}$$

$$8 + 3 \text{ is } \underline{\quad} 7 + 3 \text{ so } 8 + 3 = \underline{\quad}$$

Point out that one question was done twice. ASK: Did you get the same answer both times? Should you get the same answer both times? (yes) Discuss how it can be useful to do the same question twice (it can help you to know if you made a mistake). Now, have students decide which pair of numbers that add to 10 they should use to add two numbers. EXAMPLES:

$$9 + 2 \text{ (one more than } 8 + 2 \text{ or } 9 + 1, \text{ so } 9 + 2 = 11)$$

$$4 + 5 \text{ (one less than } 4 + 6 \text{ or } 5 + 5, \text{ so } 4 + 5 = 9)$$

**Using one more or one less than doubles.** Review finding the double of numbers from 1 to 10. Then, have students decide if the sum is one more or one less than a given double:

$$5 + 6 \text{ is } \underline{\quad} 5 + 5 \text{ so } 5 + 6 = \underline{\quad}$$

$$5 + 6 \text{ is } \underline{\quad} 6 + 6 \text{ so } 5 + 6 = \underline{\quad}$$

Repeat with  $4 + 5$  (compare to both  $4 + 4$  and  $5 + 5$ ). Point out the questions that were done twice, and again discuss the value of doing the same question twice. Then add  $6 + 7$  and  $7 + 6$  by comparing both to  $6 + 6$ . ASK: Do these questions have the same answer? (yes) How could you have predicted this? (we are adding the same numbers)

**How many more or less than a double?** Solve part a) of the following exercises as a class. Start by having students solve the given double before using it to add. Explain that for the remaining exercises, students need to do the same: find the double first, and then solve the related addition.

**Exercises:** Find the double first. Use the double to solve the next addition problem.

- a)  $7 + 7 = \underline{\quad}$  so  $8 + 7 = \underline{\quad}$       b)  $4 + 4 = \underline{\quad}$  so  $4 + 5 = \underline{\quad}$   
 c)  $9 + 9 = \underline{\quad}$  so  $9 + 10 = \underline{\quad}$       d)  $6 + 6 = \underline{\quad}$  so  $5 + 6 = \underline{\quad}$   
 e)  $7 + 7 = \underline{\quad}$  so  $7 + 6 = \underline{\quad}$       f)  $5 + 5 = \underline{\quad}$  so  $4 + 5 = \underline{\quad}$   
 g)  $3 + 3 = \underline{\quad}$  so  $3 + 4 = \underline{\quad}$       h)  $7 + 7 = \underline{\quad}$  so  $7 + 8 = \underline{\quad}$   
 i)  $8 + 8 = \underline{\quad}$  so  $8 + 9 = \underline{\quad}$       j)  $9 + 9 = \underline{\quad}$  so  $8 + 9 = \underline{\quad}$

**Bonus:**  $20 + 20 = \underline{\quad}$  so  $21 + 20 = \underline{\quad}$

**Answers:** a) 14, 15; b) 8, 9; c) 18, 19; d) 12, 11; e) 14, 13; f) 10, 9; g) 6, 7; h) 14, 15; i) 16, 17; j) 18, 17; Bonus: 40, 41

ASK: Which questions were done two ways? ( $4 + 5$ , and  $8 + 9$ ) Did you get the same answers both ways? (yes) Why is it useful to do a question more than one way? (to make sure you didn't make a mistake) Explain that doing the same problem in different ways also helps people to learn more and practice different methods.

SAY: Now you need to decide for yourself which double to use. Do part a) of the following exercises as a class.

**Exercises:** Decide which double to solve. Use the double to add.

- a)  $\underline{\quad} + \underline{\quad} = \underline{\quad}$  so  $6 + 5 = \underline{\quad}$       b)  $\underline{\quad} + \underline{\quad} = \underline{\quad}$  so  $7 + 6 = \underline{\quad}$   
 c)  $\underline{\quad} + \underline{\quad} = \underline{\quad}$  so  $8 + 9 = \underline{\quad}$       d)  $\underline{\quad} + \underline{\quad} = \underline{\quad}$  so  $9 + 8 = \underline{\quad}$

**Bonus:**  $\underline{\quad} + \underline{\quad} = \underline{\quad}$  so  $29 + 30 = \underline{\quad}$

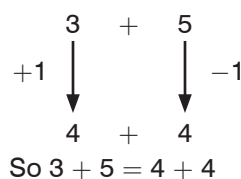
**Sample answers:** a)  $6 + 6 = 12$ , 11; b)  $6 + 6 = 12$ , 13; c)  $9 + 9 = 18$ , 17; d)  $9 + 9 = 18$ , 17; Bonus:  $30 + 30 = 60$ , 59

Encourage students to check their answers in the previous exercises by using a different double.

## Extensions

**NOTE:** Extensions 1–5 should be done in order.

- Doing the opposite to both numbers to make a double.** Write " $3 + 5 = \underline{\quad}$ " on the board. ASK: Does this look like a double? (no) Why not? (the numbers are not the same) Affix paper counters to the board: three in one pile and five in another pile. Challenge students to move only one circle so that both piles have the same number of circles. ASK: What double do you see? ( $4 + 4 = 8$ ) Did we change the



total by moving one circle? (no) Explain that  $3 + 5$  is the same as  $4 + 4$ , so even though it doesn't look like a double, we can still use doubles to find it. Now explain that we are really adding one to the pile with three and removing one from the pile with five. So, we are doing opposite things to both piles (see margin). ASK: How can you get a double from  $8 + 6$ ? From  $5 + 7$ ?

Write a double that has the same answer. Find the answer.

- a)  $5 + 3 = \underline{\quad} + \underline{\quad} = \underline{\quad}$       b)  $7 + 9 = \underline{\quad} + \underline{\quad} = \underline{\quad}$   
 c)  $10 + 8 = \underline{\quad} + \underline{\quad} = \underline{\quad}$       d)  $4 + 6 = \underline{\quad} + \underline{\quad} = \underline{\quad}$   
 e)  $1 + 3 = \underline{\quad} + \underline{\quad} = \underline{\quad}$       f)  $7 + 5 = \underline{\quad} + \underline{\quad} = \underline{\quad}$   
 g)  $6 + 8 = \underline{\quad} + \underline{\quad} = \underline{\quad}$       h)  $2 + 4 = \underline{\quad} + \underline{\quad} = \underline{\quad}$

**Bonus:**  $19 + 21 = \underline{\quad} + \underline{\quad} = \underline{\quad}$

**Answers:** a)  $4 + 4 = 8$ , b)  $8 + 8 = 16$ , c)  $9 + 9 = 18$ , d)  $5 + 5 = 10$ ,  
 e)  $2 + 2 = 4$ , f)  $6 + 6 = 12$ , g)  $7 + 7 = 14$ , h)  $3 + 3 = 6$ ,  
 Bonus:  $20 + 20 = 40$

2. Have students complete **BLM Addition Using Doubles** (p Q-66).

**Answers:** the same as, 16, 16; 1 less than, 18, 17; 2 more than, 14, 16;  
 $9 + 7$ , yes; it can be useful to do the same question in two ways to make sure you didn't make a mistake

3. **Compare the different ways of adding.** Write " $6 + 7 = \underline{\quad}$ " on the board. Challenge the class to come up with as many different strategies as they can to solve the question. You could get them started with the following: Start at 6 and count on until you have seven fingers up. Demonstrate by saying 6 with no fingers up, 7 with one finger up, and so on, until you have seven fingers up. Other strategies include using 10 ( $6 + 7 = 10 + 3 = 13$ ) or using doubles ( $6 + 6 = 12$  so  $6 + 7 = 13$ ). ASK: Which way is easiest? Which way is slowest? Emphasize that if students know their doubles they only have to add 1, so this is the easiest method. Using 10, although easier than counting on past 6, still requires students to solve  $7 - 4$ , since 4 makes 10 with 6 (or  $6 - 3$  if they use what makes 10 with 7). Emphasize that by doubling, students are changing the problem into two simpler problems—doubling and adding 1—that they already know how to do.

Have students choose either using the nearest 10 or doubles to solve the following addition problems. They must write which simpler problem they used.

- a)  $7 + 6$       b)  $9 + 4$       c)  $5 + 6$       d)  $29 + 31$   
 e)  $59 + 16$       f)  $41 + 28$       g)  $40 + 42$       h)  $51 + 49$



**Sample answers:** a)  $6 + 6 = 12$ , so  $7 + 6 = 13$ ; b)  $10 + 3 = 13$ , so  $9 + 4 = 13$ ; c)  $5 + 5 = 10$ , so  $5 + 6 = 11$ ; d)  $30 + 30 = 60$ , so  $29 + 31 = 60$ ; e)  $60 + 15 = 75$ , so  $59 + 16 = 75$ ; f)  $40 + 29 = 69$ , so  $41 + 28 = 69$ ; g)  $40 + 40 = 80$ , so  $40 + 42 = 82$ ; h)  $50 + 50 = 100$ , so  $51 + 49 = 100$

4. Write “ $4 + 8$ ” on the board. Affix paper counters to the board to show 4 in one row and 8 below in another row. Ask students how to move counters to make a double. (move 2 from the bottom row to the top row) Have a volunteer move the counters. ASK: What is the double? ( $6 + 6$ ) Do  $4 + 8$  and  $6 + 6$  have the same answer? (yes) How do you know? (we didn’t change the total number of counters, we just rearranged them) Have students complete the following exercises.

**Exercises:** Write a double that has the same answer. Find the answer.

- a)  $9 + 5 = \underline{\quad} + \underline{\quad} = \underline{\quad}$       b)  $2 + 6 = \underline{\quad} + \underline{\quad} = \underline{\quad}$   
 c)  $12 + 8 = \underline{\quad} + \underline{\quad} = \underline{\quad}$       d)  $7 + 11 = \underline{\quad} + \underline{\quad} = \underline{\quad}$   
 e)  $3 + 7 = \underline{\quad} + \underline{\quad} = \underline{\quad}$       f)  $5 + 1 = \underline{\quad} + \underline{\quad} = \underline{\quad}$

**Answers:** a)  $7 + 7 = 14$ , b)  $4 + 4 = 8$ , c)  $10 + 10 = 20$ , d)  $9 + 9 = 18$ , e)  $5 + 5 = 10$ , f)  $3 + 3 = 6$

5. Have students complete **BLM More Addition Using Doubles** (p Q-67).

**Answers:** 12, 10; 16, 14; 12, 12; 18, 17; 20, 20; 16, 16; 12, 12; 10, 10; 14, 16; 16, 18; 20, 20;  $7 + 9$ . Yes.


6. Have students complete **BLM Doubles and Mirrors** (p Q-68).  
If available, you can use a MIRA and counters to model the pictures on the BLM.

**Answers:**  $3 + 3 = 6$ ,  $5 + 5 = 10$ ;  $2 + 2 + 1 = 5$ ;  $4 + 4 + 1 = 9$ ,  
 $1 + 1 + 1 = 3$

# Tens Cards

1 0	2 0	3 0
4 0	5 0	6 0
7 0	8 0	9 0

# Ones Cards

1	1	2	2	3	3
					
4	4	5	5	6	6
7	7	8	8	9	9

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# Switching Ones

$$\begin{array}{r} 13 \\ + 5 \\ \hline 18 \end{array} \quad \begin{array}{r} 10 + 3 \\ + 5 \\ \hline 10 + 8 \end{array}$$

←

$$\begin{array}{r} 15 \\ + 3 \\ \hline 18 \end{array} \quad \begin{array}{r} 10 + 5 \\ + 3 \\ \hline 10 + 8 \end{array}$$

←

$$\begin{array}{r} 17 \\ + 2 \\ \hline \end{array} \quad \begin{array}{r} 10 + 7 \\ + 2 \\ \hline \end{array}$$

←

$$\begin{array}{r} 12 \\ + 7 \\ \hline \end{array} \quad \begin{array}{r} 10 + 2 \\ + 7 \\ \hline \end{array}$$

←

$$\begin{array}{r} 25 \\ + 4 \\ \hline \end{array} \quad \begin{array}{r} 20 + 5 \\ + 4 \\ \hline \end{array}$$

←

$$\begin{array}{r} 24 \\ + 5 \\ \hline \end{array} \quad \begin{array}{r} 20 + 4 \\ + 5 \\ \hline \end{array}$$

←

$$14 + 3 = 13 + \underline{\quad}$$

$$16 + 2 = 12 + \underline{\quad}$$

$$11 + 5 = 15 + \underline{\quad}$$

$$23 + 4 = 24 + \underline{\quad}$$

$$36 + 2 = 32 + \underline{\quad}$$

$$25 + 3 = 23 + \underline{\quad}$$

# Switching Tens

$$\begin{array}{r} 15 \\ + 30 \\ \hline 45 \end{array} \quad \begin{array}{r} 10 + 5 \\ + 30 \\ \hline 40 + 5 \end{array}$$

←

$$\begin{array}{r} 35 \\ + 10 \\ \hline 45 \end{array} \quad \begin{array}{r} 30 + 5 \\ + 10 \\ \hline 40 + 5 \end{array}$$

←

$$\begin{array}{r} 17 \\ + 20 \\ \hline \end{array} \quad \begin{array}{r} 10 + 7 \\ + 20 \\ \hline \end{array}$$

$$\begin{array}{r} 27 \\ + 10 \\ \hline \end{array} \quad \begin{array}{r} 20 + 7 \\ + 10 \\ \hline \end{array}$$

$$\begin{array}{r} 36 \\ + 50 \\ \hline \end{array} \quad \begin{array}{r} 30 + 6 \\ + 50 \\ \hline \end{array}$$

$$\begin{array}{r} 56 \\ + 30 \\ \hline \end{array} \quad \begin{array}{r} 50 + 6 \\ + 30 \\ \hline \end{array}$$

$$17 + 20 = 27 + \underline{\quad}$$

$$15 + 20 = 25 + \underline{\quad}$$

$$16 + 30 = 36 + \underline{\quad}$$

$$24 + 50 = 54 + \underline{\quad}$$

$$24 + 30 = 34 + \underline{\quad}$$

$$16 + 20 = 26 + \underline{\quad}$$

## Groups of 10 (I)

- ☐ Make a group of 10 circles. Use all the circles from the left side and some circles from the right side.
- ☐ Count the circles that are left after you group 10.

6                      7

10                      3

3                      9

10                      \_\_\_\_\_

7                      5

10                      \_\_\_\_\_

5                      6

10                      \_\_\_\_\_

4                      9

10                      \_\_\_\_\_

6                      8

10                      \_\_\_\_\_

# Groups of 10 (2)

- ☐ Group 10 in two different ways.
- ☐ Count the stars that are left after you group 10.

 $10 + \underline{3}$	 $\underline{3} + 10$
---	--

  $10 + \underline{\hspace{2cm}}$	  $\underline{\hspace{2cm}} + 10$
--	---

  $10 + \underline{\hspace{2cm}}$	  $\underline{\hspace{2cm}} + 10$
--	---

  $10 + \underline{\hspace{2cm}}$	  $\underline{\hspace{2cm}} + 10$
--	---

# Split to Make 10 (I)

- ☐ Find the number that makes 10 with the first number.
- ☐ Write 7 using the number you found.

~~$7 = 1 + 6$~~

$7 = 2 + 5$

$7 = 3 + 4$

$7 = 6 + 1$

$7 = 5 + 2$

$7 = 4 + 3$

these make 10

$$9 + 7 = 9 + \boxed{1} + \boxed{6}$$

↑  
left over

these make 10

$$7 + 7 = 7 + \boxed{\phantom{0}} + \boxed{\phantom{0}}$$

↑  
left over

these make 10

$$6 + 7 = 6 + \boxed{\phantom{0}} + \boxed{\phantom{0}}$$

↑  
left over

these make 10

$$4 + 7 = 4 + \boxed{\phantom{0}} + \boxed{\phantom{0}}$$

↑  
left over

these make 10

$$5 + 7 = 5 + \boxed{\phantom{0}} + \boxed{\phantom{0}}$$

↑  
left over

these make 10

$$8 + 7 = 8 + \boxed{\phantom{0}} + \boxed{\phantom{0}}$$

↑  
left over



# Split to Make 10 (2)

☐ Write 8 in different ways.

$$8 = 1 + 7 \quad 8 = 2 + \underline{\quad} \quad 8 = 3 + \underline{\quad} \quad 8 = 4 + \underline{\quad}$$

$$8 = 7 + 1 \quad 8 = \underline{\quad} + 2 \quad 8 = \underline{\quad} + 3$$

☐ Find the number that makes 10 with the first number.

☐ Write 8 using the number you found.

☐ Use 10 to add.

these make 10

$$7 + 8 = 7 + \boxed{3} + \boxed{5}$$

$$= 10 + \boxed{5} = \boxed{15}$$

these make 10

$$5 + 8 = 5 + \boxed{\quad} + \boxed{\quad}$$

$$= 10 + \boxed{\quad} = \boxed{\quad}$$

these make 10

$$6 + 8 = 6 + \boxed{\quad} + \boxed{\quad}$$

$$= 10 + \boxed{\quad} = \boxed{\quad}$$

these make 10

$$8 + 8 = 8 + \boxed{\quad} + \boxed{\quad}$$

$$= 10 + \boxed{\quad} = \boxed{\quad}$$

these make 10

$$4 + 8 = 4 + \boxed{\quad} + \boxed{\quad}$$

$$= 10 + \boxed{\quad} = \boxed{\quad}$$

these make 10

$$9 + 8 = 9 + \boxed{\quad} + \boxed{\quad}$$

$$= 10 + \boxed{\quad} = \boxed{\quad}$$

## Many Ways to Write a Number

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

☐ Use tens and ones blocks to find the number.

3 tens and 6 ones = \_\_\_\_\_

2 tens and 16 ones = \_\_\_\_\_

1 ten and 26 ones = \_\_\_\_\_

0 tens and 36 ones = \_\_\_\_\_

2 tens and 23 ones = \_\_\_\_\_

1 ten and 33 ones = \_\_\_\_\_

4 tens and 3 ones = \_\_\_\_\_

3 tens and 13 ones = \_\_\_\_\_

☐ Find how many more ones to make 45.

3 tens and \_\_\_\_\_ ones = 45

2 tens and \_\_\_\_\_ ones = 45

4 tens and \_\_\_\_\_ ones = 45

0 tens and \_\_\_\_\_ ones = 45

# Adding—Step 1

- ☐ Add the ones.
- ☐ Write the tens digit in the tens column.
- ☐ Write the ones digit in the ones column.

$$5 + 9 = \begin{array}{|c|} \hline \text{tens} \\ \hline \end{array} \begin{array}{|c|} \hline \text{ones} \\ \hline \end{array}$$

$$\begin{array}{r} \begin{array}{|c|} \hline / \\ \hline \end{array} \\ 3 \quad 5 \\ + 1 \quad 9 \\ \hline \begin{array}{|c|} \hline \end{array} \begin{array}{|c|} \hline 4 \\ \hline \end{array} \end{array}$$

$$3 + 8 = \begin{array}{|c|} \hline \text{tens} \\ \hline \end{array} \begin{array}{|c|} \hline \text{ones} \\ \hline \end{array}$$

$$\begin{array}{r} \begin{array}{|c|} \hline \\ \hline \end{array} \\ 3 \quad 3 \\ + 2 \quad 8 \\ \hline \begin{array}{|c|} \hline \end{array} \begin{array}{|c|} \hline \end{array} \end{array}$$

$$6 + 4 = \begin{array}{|c|} \hline \text{tens} \\ \hline \end{array} \begin{array}{|c|} \hline \text{ones} \\ \hline \end{array}$$

$$\begin{array}{r} \begin{array}{|c|} \hline \\ \hline \end{array} \\ 3 \quad 6 \\ + 5 \quad 4 \\ \hline \begin{array}{|c|} \hline \end{array} \begin{array}{|c|} \hline \end{array} \end{array}$$

$$\begin{array}{r} \begin{array}{|c|} \hline \\ \hline \end{array} \\ 3 \quad 6 \\ + 2 \quad 6 \\ \hline \begin{array}{|c|} \hline \end{array} \begin{array}{|c|} \hline \end{array} \end{array}$$

$$\begin{array}{r} \begin{array}{|c|} \hline \\ \hline \end{array} \\ 1 \quad 9 \\ + 4 \quad 6 \\ \hline \begin{array}{|c|} \hline \end{array} \begin{array}{|c|} \hline \end{array} \end{array}$$

$$\begin{array}{r} \begin{array}{|c|} \hline \\ \hline \end{array} \\ 2 \quad 8 \\ + 3 \quad 5 \\ \hline \begin{array}{|c|} \hline \end{array} \begin{array}{|c|} \hline \end{array} \end{array}$$

$$\begin{array}{r} \begin{array}{|c|} \hline \\ \hline \end{array} \\ 4 \quad 4 \\ + 3 \quad 8 \\ \hline \begin{array}{|c|} \hline \end{array} \begin{array}{|c|} \hline \end{array} \end{array}$$

$$\begin{array}{r} \begin{array}{|c|} \hline \\ \hline \end{array} \\ 5 \quad 7 \\ + 2 \quad 5 \\ \hline \begin{array}{|c|} \hline \end{array} \begin{array}{|c|} \hline \end{array} \end{array}$$

$$\begin{array}{r} \begin{array}{|c|} \hline \\ \hline \end{array} \\ 1 \quad 8 \\ + 3 \quad 8 \\ \hline \begin{array}{|c|} \hline \end{array} \begin{array}{|c|} \hline \end{array} \end{array}$$

# Addition Dice

I rolled \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

90

2	
<hr/>	

70

2	
<hr/>	

40

1	
<hr/>	

I rolled \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

90

2	
<hr/>	

70

2	
<hr/>	

40

1	
<hr/>	

# What Is the Double?

$\begin{array}{r} 3 \\ + 3 \\ \hline \boxed{6} \end{array}$	$\begin{array}{r} 4 \\ + 4 \\ \hline \boxed{\phantom{0}} \end{array}$	$\begin{array}{r} 7 \\ + 7 \\ \hline \boxed{\phantom{0}} \end{array}$	$\begin{array}{r} 0 \\ + 0 \\ \hline \boxed{\phantom{0}} \end{array}$	$\begin{array}{r} 6 \\ + 6 \\ \hline \boxed{\phantom{0}} \end{array}$
---	---	---	---	---

$\begin{array}{r} 1 \\ + 1 \\ \hline \boxed{\phantom{0}} \end{array}$	$\begin{array}{r} 8 \\ + 8 \\ \hline \boxed{\phantom{0}} \end{array}$	$\begin{array}{r} 2 \\ + 2 \\ \hline \boxed{\phantom{0}} \end{array}$	$\begin{array}{r} 5 \\ + 5 \\ \hline \boxed{\phantom{0}} \end{array}$	$\begin{array}{r} 9 \\ + 9 \\ \hline \boxed{\phantom{0}} \end{array}$
---	---	---	---	---

The double of 8 is \_\_\_\_\_.

The double of 5 is \_\_\_\_\_.

The double of 4 is \_\_\_\_\_.

The double of 7 is \_\_\_\_\_.

The double of 0 is \_\_\_\_\_.

The double of 9 is \_\_\_\_\_.

The double of 3 is \_\_\_\_\_.

The double of 2 is \_\_\_\_\_.

The double of 1 is \_\_\_\_\_.

The double of 6 is \_\_\_\_\_.

# Doubles (I)

☐ Double each number.

$$\begin{array}{r} 3 \\ + 3 \\ \hline \boxed{6} \end{array}$$

☐ 6 is double 3.

$$\begin{array}{r} 30 \\ + 30 \\ \hline \boxed{60} \end{array}$$

☐ 60 is double 30.

$$\begin{array}{r} 2 \\ + 2 \\ \hline \boxed{\phantom{00}} \end{array}$$

☐ is double 2.

$$\begin{array}{r} 20 \\ + 20 \\ \hline \boxed{\phantom{00}} \end{array}$$

☐ is double 20.

☐ is double 4.

so

☐ is double 40.

☐ is double 5.

so

☐ is double 50.

## Doubles (2)

- ☐ Separate the tens and ones.  
☐ Find the double.

$$23 = \underline{20} + \underline{3}$$

The double is:

$$\underline{40} + \underline{6} = \underline{46}$$

$$34 = \underline{\quad} + \underline{\quad}$$

The double is:

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

$$45 = \underline{\quad} + \underline{\quad}$$

The double is:

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

$$32 = \underline{\quad} + \underline{\quad}$$

The double is:

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

$$27 = 20 + \underline{7}$$

The double is:

$$40 + \underline{14}$$

$$= 50 + \underline{\quad}$$

$$= \underline{\quad}$$

$$38 = 30 + \underline{\quad}$$

The double is:

$$60 + \underline{\quad}$$

$$= 70 + \underline{\quad}$$

$$= \underline{\quad}$$

$$26 = \underline{20} + \underline{6}$$

The double is:

$$\underline{40} + \underline{12} = \underline{\quad}$$

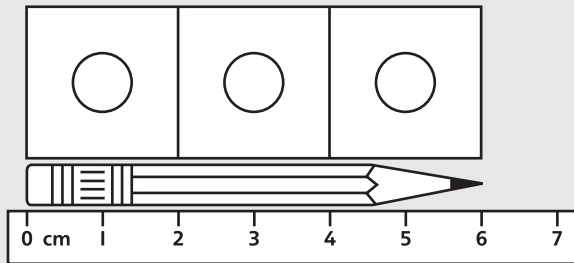
$$49 = \underline{\quad} + \underline{\quad}$$


The double is:

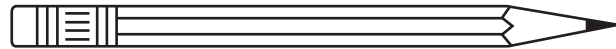
$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$


# Big Cubes and Centimetres

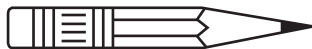
- ☐ Measure two ways.
- ☐ Use big  and then use cm.




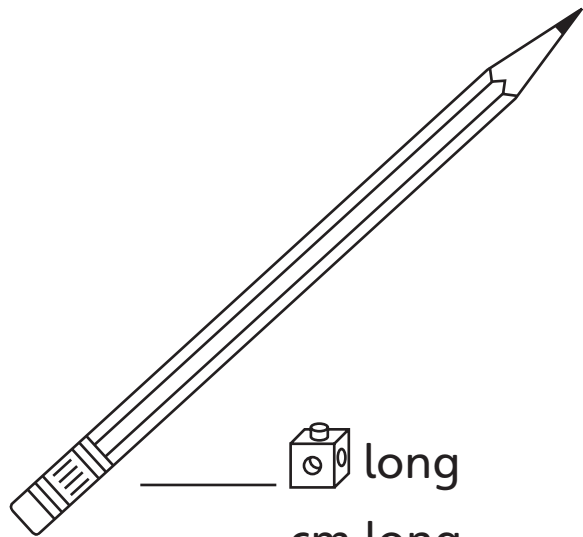
  3    long  
  6   cm long




        long  
       cm long




        long  
       cm long



        long  
       cm long

The number of cm is always \_\_\_\_\_ the number of .

A book is 14  long. It is \_\_\_\_\_ cm long.



## Finding Doubles Using 5

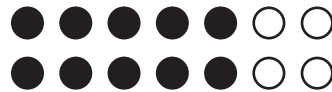
☐ Find the double using 5.

$$8 = 5 + 3$$



$$\text{Double 8 is } \underline{10} + \underline{6} = \underline{16}$$

$$7 = 5 + 2$$



$$\text{Double 7 is } \underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$$

☐ Draw your own model to find the double.

$$9 = 5 + \underline{\quad\quad}$$

$$\text{Double 9 is } \underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$$

$$10 = 5 + \underline{\quad\quad}$$

$$\text{Double 10 is } \underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$$

☐ Now find the double without a model.

$$6 = 5 + \underline{\quad\quad}$$

$$\text{Double 6 is } \underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad}$$

## Addition Using Doubles

- ☐ Write how many more or less, or the same as.
- ☐ Find the double.
- ☐ Add.

9 + 11 is the same as 10 + 10

$$10 + 10 = \underline{20} \quad \text{so} \quad 9 + 11 = \underline{20}$$

9 + 7 is \_\_\_\_\_ 8 + 8

$$8 + 8 = \underline{\quad} \quad \text{so} \quad 9 + 7 = \underline{\quad}$$

8 + 9 is \_\_\_\_\_ 9 + 9

$$9 + 9 = \underline{\quad} \quad \text{so} \quad 8 + 9 = \underline{\quad}$$

9 + 7 is \_\_\_\_\_ 7 + 7

$$7 + 7 = \underline{\quad} \quad \text{so} \quad 9 + 7 = \underline{\quad}$$

Which question did you do in two ways? \_\_\_\_\_ + \_\_\_\_\_

Did you get the same answer both times? \_\_\_\_\_

- ☐ Explain how it can be useful to do the same question in two ways.

## More Addition Using Doubles

$$5 + 5 = \underline{10}$$

so  $5 + 4 = \underline{9}$

$$6 + 6 = \underline{\quad}$$

so  $4 + 6 = \underline{\quad}$

$$8 + 8 = \underline{\quad}$$

so  $6 + 8 = \underline{\quad}$

$$6 + 6 = \underline{\quad}$$

so  $7 + 5 = \underline{\quad}$

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

so  $8 + 9 = \underline{\quad}$

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

so  $9 + 11 = \underline{\quad}$

$$8 + 8 = \underline{\quad}$$

so  $7 + 9 = \underline{\quad}$

$$6 + 6 = \underline{\quad}$$

so  $4 + 8 = \underline{\quad}$

$$5 + 5 = \underline{\quad}$$

so  $3 + 7 = \underline{\quad}$

$$7 + 7 = \underline{\quad}$$

so  $7 + 9 = \underline{\quad}$

$$8 + 8 = \underline{\quad}$$

so  $10 + 8 = \underline{\quad}$

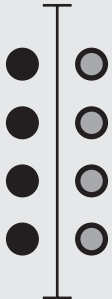
$$10 + 10 = \underline{\quad}$$


so  $8 + 12 = \underline{\quad}$


☐ Circle the **bold** question you did two ways.

Did you get the same answer? \_\_\_\_\_

# Doubles and Mirrors

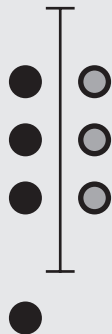



$$\boxed{4} + \boxed{4} = \boxed{8}$$



$$\boxed{\phantom{0}} + \boxed{\phantom{0}} = \boxed{\phantom{0}}$$



$$\boxed{\phantom{0}} + \boxed{\phantom{0}} = \boxed{\phantom{0}}$$

Now some dots cannot be seen in the mirror.



$$\boxed{3} + \boxed{3} + 1 = \boxed{7}$$


$$\boxed{\phantom{0}} + \boxed{\phantom{0}} + 1 = \boxed{\phantom{0}}$$


$$\boxed{\phantom{0}} + \boxed{\phantom{0}} + 1 = \boxed{\phantom{0}}$$


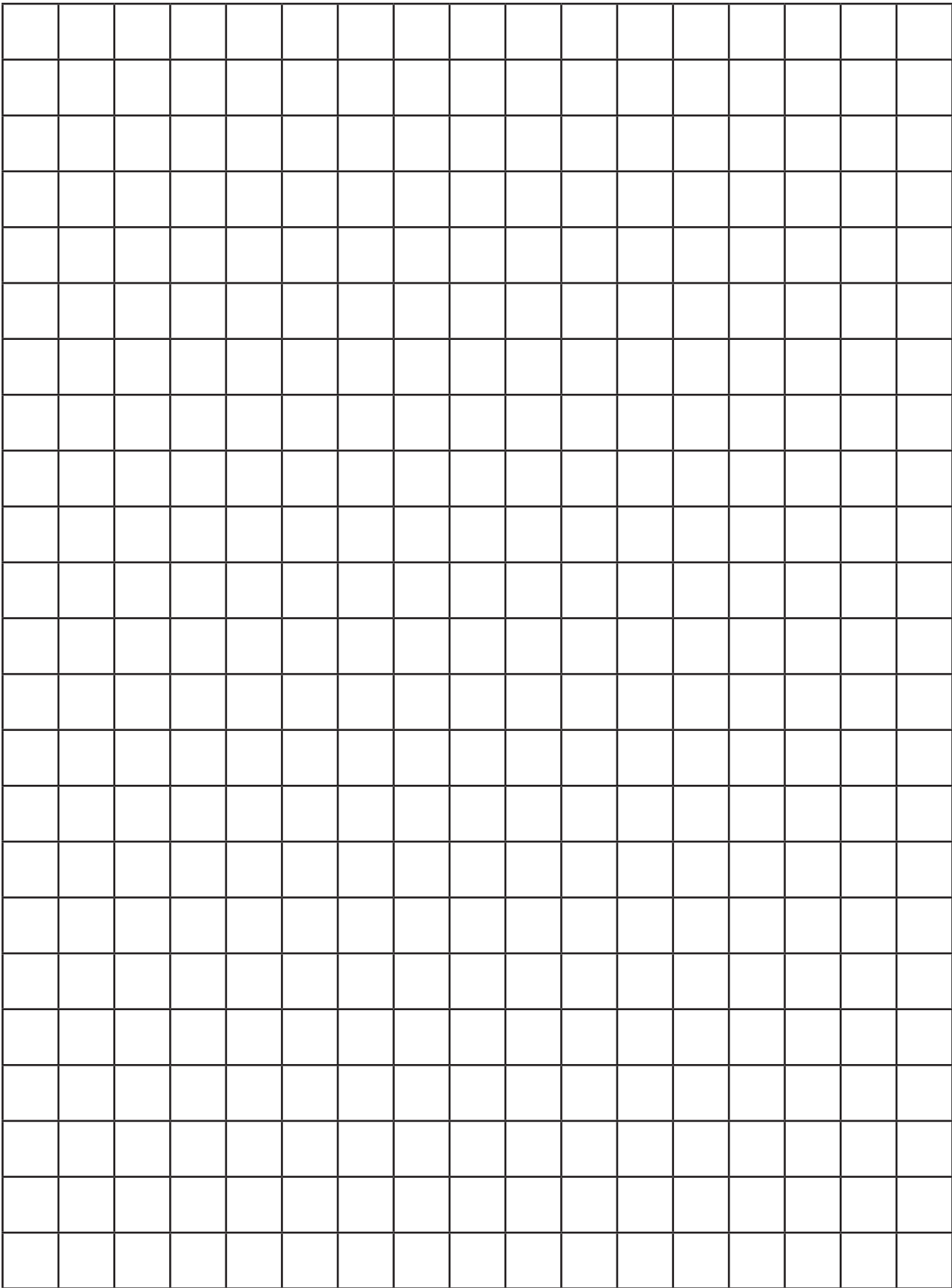
$$\boxed{\phantom{0}} + \boxed{\phantom{0}} + 1 = \boxed{\phantom{0}}$$

# Hundreds Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

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# I cm Grid Paper



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