

# Unit 13 Number Sense: Addition and Subtraction Strategies

## Introduction

In this unit, students will learn to recognize useful types of sums (such as doubles, near doubles, and pairs that add to 5 or 10) and use their knowledge to develop effective strategies for adding numbers. Students will use their knowledge of addition facts and the relationship between addition and subtraction to subtract. Students will develop automatic recall of number facts. They will also solve simple word problems involving strategies for addition.

## Meeting Your Curriculum

Alberta—Lesson NS1-87 is optional. All other lessons in this unit are required.

British Columbia—Lessons NS1-76, NS1-77, and NS1-87 are optional. All other lessons in this unit are required.

Manitoba—Lesson NS1-87 is optional. All other lessons in this unit are required.

Ontario—Lessons NS1-76, NS1-77, NS1-81, and NS1-84 are optional. All other lessons in this unit are required.

## Vocabulary

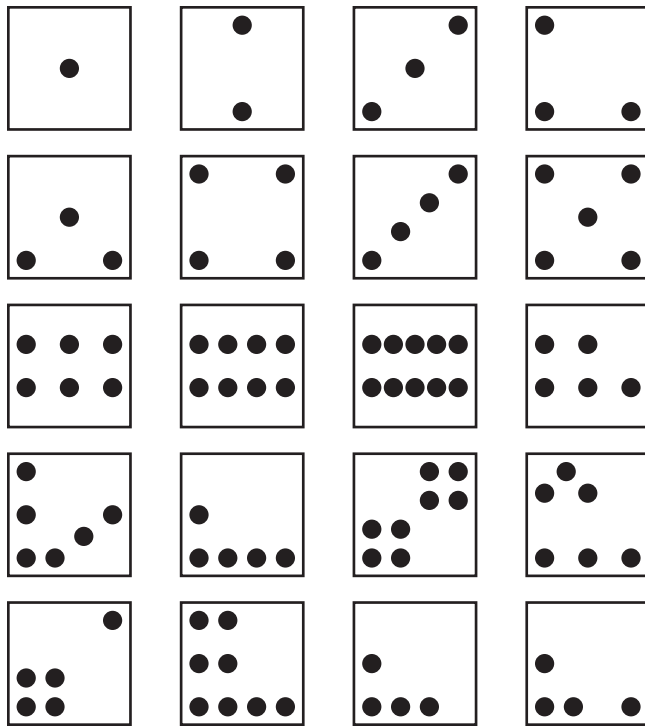
Terms you might add to the word wall include: use 5 to add, use 10 to add, use doubles to add.

## Materials

In many lessons, we provide opportunities for fluency practice for which you will need to make many dot cards (which you can show in different orientations for variety) and addition and subtraction cards. After you draw the dots (you can also use round stickers instead) or write the addition or subtraction fact, write the number of dots or the answer on the back of each card for quick reference. You might laminate the cards or put them in sheet covers so that you can write on them with erasable markers (for example, you might want to show specific groupings that students see by circling some of them). These cards will also be useful for number talks.

Before Lesson NS1-76, make the following addition cards and dot cards:

$1 + 0$	$2 + 0$	$3 + 0$	$4 + 0$	$5 + 0$
$0 + 1$	$0 + 2$	$0 + 3$	$0 + 4$	$0 + 5$
$1 + 1$	$1 + 2$	$2 + 1$	$1 + 3$	$3 + 1$
$4 + 1$	$1 + 4$	$2 + 3$	$3 + 2$	
$2 + 2$	$3 + 3$	$4 + 4$	$5 + 5$	

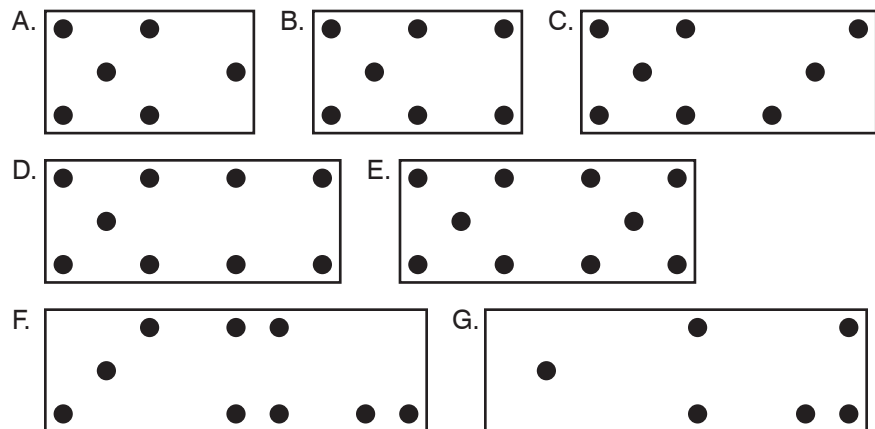


Before Lesson NS1-77, make the following subtraction cards:

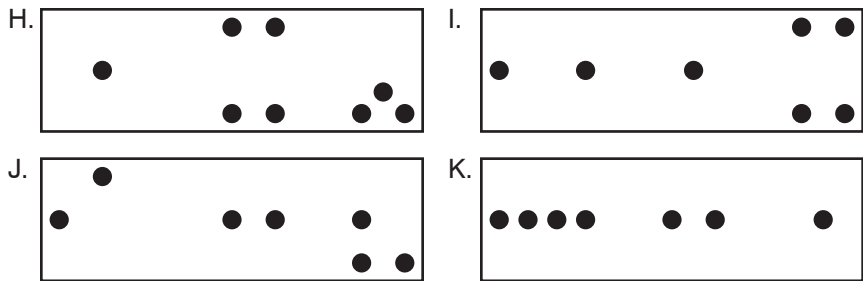
$1 - 0$	$2 - 0$	$3 - 0$	$4 - 0$	$5 - 0$
$1 - 1$	$2 - 2$	$3 - 3$	$4 - 4$	$5 - 5$
$2 - 1$	$3 - 1$	$4 - 1$	$5 - 1$	
$3 - 2$	$4 - 2$	$5 - 2$	$4 - 3$	$5 - 3$
$5 - 4$	$6 - 3$	$8 - 4$	$10 - 5$	

Before Lesson NS1-78, make the following addition cards and dot cards:

A. $5 + 1$	B. $1 + 5$	C. $5 + 2$	D. $2 + 5$
E. $5 + 3$	F. $3 + 5$	G. $5 + 4$	H. $4 + 5$
I. $1 + 2 + 3$	J. $2 + 1 + 4$	K. $1 + 4 + 3$	L. $3 + 4 + 2$
M. $2 + 2 + 3$	N. $4 + 2 + 1$		

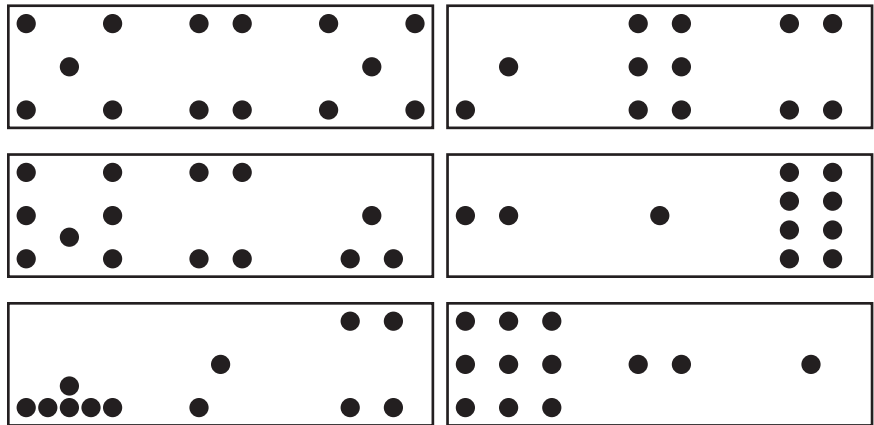


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Before Lesson NS1-80, make the following addition cards and dot cards:

$10 + 1$	$2 + 10$	$10 + 3$	$4 + 10$	$10 + 5$
$6 + 10$	$10 + 7$	$8 + 10$	$10 + 9$	$10 + 10$
$3 + 1 + 7$	$4 + 2 + 6$	$3 + 5 + 5$	$4 + 8 + 2$	$7 + 3 + 5$
$9 + 6 + 1$	$7 + 7 + 3$	$1 + 9 + 8$	$6 + 4 + 9$	

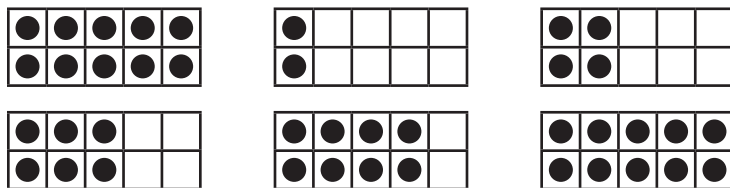


Before Lesson NS1-83, make the following addition cards:

$8 + 3$	$7 + 4$	$6 + 5$	$5 + 6$	$4 + 7$	$3 + 8$
$7 + 2$	$6 + 3$	$5 + 4$	$4 + 5$	$3 + 6$	$2 + 7$

Before Lesson NS1-85, make the following addition cards and dot cards:

$6 + 6$	$7 + 7$	$8 + 8$	$9 + 9$	$10 + 10$
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Before Lesson NS1-86, make the following addition cards:

$6 + 7$	$7 + 6$	$7 + 8$	$8 + 7$	$8 + 9$	$9 + 8$
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**Generic BLMs.** In addition to the BLMs provided at the end of this unit, the following Generic BLMs, found in section V, are used in Unit 13:

**BLM Game Cards** (p V-3)

**BLM Ten-Frames** (p V-2)

**Assessment.** The assessment checklist for this unit can be found in section W. The following table indicates the lessons covered by a test, which can be found in section X.

Test	Lessons NS1-81 to 82
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# NS1-75 Pairs Adding to 5

Pages 65–66

## CURRICULUM REQUIREMENT

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

## VOCABULARY

making 5

## Goals

Students will find many combinations of numbers that add to 5.

## PRIOR KNOWLEDGE REQUIRED

Knows that we have five fingers on each hand  
Can complete addition problems where one addend is missing

## MATERIALS

**BLM Five-Dot Dominoes** (p P-45)  
number cards from 1 to 4, four of each per student

up		down		
5	+	0	=	5
3	+	2	=	5
1	+	4	=	5
:		:		:



**Finding missing addends (to 5) using the fingers on one hand.** Hold up all your fingers on one hand. ASK: How many fingers do I have up? (5) Then hold up three fingers and ASK: How many fingers do I have up? (3) How many are not up? (2) What is  $3 + 2$ ? (5) How do you know? (there are 5 fingers on one hand) As a class, go through all the ways you can hold up the fingers on one hand. Record the combinations on the board as shown in the margin.

SAY: I want to know what number with 4 makes 5. Write on the board:

$$4 + \underline{\quad} = 5$$

SAY: I am going to show you how to use your five fingers to find the missing number. ASK: How many fingers should I hold up? (4) What does the number of fingers I'm not holding up tell me? (the missing number) Add labels to the number sentence and have a volunteer fill in the blank, as shown below:

$$\begin{array}{ccccc} 4 & + & 1 & = & 5 \\ \uparrow & & \uparrow & & \\ \text{up} & & \text{not up} & & \end{array}$$

Complete more addition sentences this way, including sentences with 0 as an addend.

**Exercises:** Hold up the correct number of fingers to find the missing number.

- |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|
| a) $3 + \underline{\quad} = 5$ | b) $4 + \underline{\quad} = 5$ | c) $0 + \underline{\quad} = 5$ |
| d) $5 = 2 + \underline{\quad}$ | e) $5 = 5 + \underline{\quad}$ | f) $5 = 4 + \underline{\quad}$ |
| g) $5 = 0 + \underline{\quad}$ |                                |                                |

**Answers:** a) 2, b) 1, c) 5, d) 3, e) 0, f) 1, g) 5

In the following exercises, the first addend is missing; that is, the number of fingers “not up” is given.

## EXTRA PRACTICE

### BLM Five-Dot Dominoes

Answers: 1, 3, 2, 0, 4, 2, 1

**Exercises:** Hold up the correct number of fingers to find the missing number.

- a)  $\underline{\quad} + 4 = 5$       b)  $\underline{\quad} + 2 = 5$       c)  $5 = \underline{\quad} + 3$   
d)  $5 = \underline{\quad} + 2$       e)  $5 = \underline{\quad} + 5$

Answers: a) 1, b) 3, c) 2, d) 3, e) 0

## ACTIVITIES 1–2 (Optional)

1. Play **Modified Go Fish** with target 5 (see Introduction, p A-51)
2. **A solitaire game.** Give each student four of each number card from 1 to 4. Students shuffle the cards and turn over the first eight cards, putting them face up in two rows of four. They make a pile from the rest of the cards. They take another card from the pile—if it makes 5 with any of the cards that are face up, they place it on that card; otherwise they discard it. Students continue until they have gone through all the cards, then repeat with the cards in the discard pile, adding them, where possible, to any of the piles that are face up. Students go through the discard pile as many times as they can, and try to use up all the cards.

Explain to students that they can use pairs that add to 5 to subtract from 5.

**Exercises:** Subtract by using a pair that adds to 5.

- a)  $5 - 3$       b)  $5 - 1$       c)  $5 - 4$       d)  $5 - 5$

Answers: a) 2, b) 4, c) 1, d) 0

## Extensions

1. Circle the number sentences that are not correct.

$$5 + 0 = 5 \quad 1 + 4 = 5 \quad 3 + 3 = 5 \quad 4 + 1 = 5 \quad 2 + 4 = 5$$

Answers:  $3 + 3 = 5$  and  $2 + 4 = 5$  are not correct.

2. Find the missing number.

- a)  $1 + 2 + \underline{\quad} = 5$       b)  $2 + 2 + \underline{\quad} = 5$   
c)  $1 + 3 + \underline{\quad} = 5$       **Bonus:**  $3 + 1 + 1 + \underline{\quad} = 5$

Answers: a) 2, b) 1, c) 1, Bonus: 0

3. Use tens blocks to find the pairs that add to 50.

- a) 2 tens +  $\underline{\quad}$  tens = 5 tens, so  $20 + \underline{\quad} = 50$   
b) 4 tens +  $\underline{\quad}$  ten = 5 tens, so  $40 + \underline{\quad} = 50$

Answers: a) 3, 30; b) 1, 10

# NS1-76 Addition Facts

Page 67

## CURRICULUM REQUIREMENT

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

## VOCABULARY

add  
addition

## Goals

Students will subitize up to five objects in different groupings and develop fluency in adding within 5.

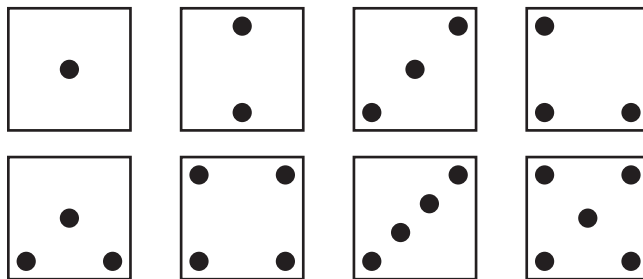
## PRIOR KNOWLEDGE REQUIRED

Can count to 5  
Can add within 5

## MATERIALS

dot cards and addition cards (see unit introduction)

**Subitizing up to 5.** In random order, hold up each of the following dot cards for two seconds, hide the card, and have students signal the number of dots on each card using the fingers on one hand:



**NOTE:** When practising subitizing with dot cards or addition cards in this lesson, follow these steps with each set of cards. Hold up each card for two seconds, hide the card, and have students signal thumbs up when they have an answer. Invite volunteers to share their answers. Ask the volunteers how they knew the answer to help other students understand their strategy. Use each sequence of cards first in order, then in random order until all students can answer confidently.

**Adding 0.** Practise subitizing with the following addition cards:

$$1 + 0 \quad 2 + 0 \quad 3 + 0 \quad 4 + 0 \quad 5 + 0$$

Then repeat with these addition cards, which show the reverse of the previous additions:

$$0 + 1 \quad 0 + 2 \quad 0 + 3 \quad 0 + 4 \quad 0 + 5$$

**Adding 1 using one more than.** Elicit the strategy that adding 1 is the same as finding one more than a number using the following addition cards:

$$1 + 1 \quad 2 + 1 \quad 3 + 1 \quad 4 + 1$$

Then repeat with the following addition cards in order:

$$2 + 1 \quad 1 + 2 \quad 3 + 1 \quad 1 + 3 \quad 4 + 1 \quad 1 + 4$$

Elicit the strategy that adding a pair of numbers gives the same answer.

SAY: It does not matter whether you add 1 to a number or add a number to 1. You still just need to find one more. Then repeat with only the following addition cards in random order:

$$1 + 3 \quad 1 + 2 \quad 1 + 4$$

Shuffle all the cards used in this section and repeat.

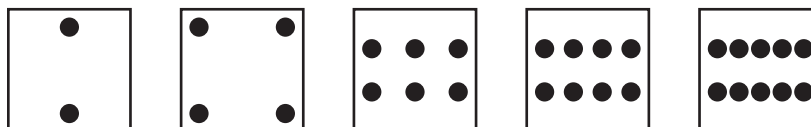
**Adding 2 using two more than.** Practise subitizing with the following addition cards:

$$2 + 2 \quad 3 + 2 \quad 2 + 3$$

Elicit the strategy that adding 2 is the same as finding two more; they can just say the next two numbers. Also, remind students that it does not matter whether they add 2 to a number or add a number to 2, they are still just finding two more.

Shuffle all the cards used in this section and repeat.

**Doubling numbers within 5.** Practise subitizing with the following dot cards, emphasizing the connection with skip counting as you go:

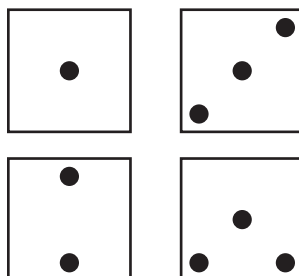


Repeat with the following addition cards, again emphasizing the connection with skip counting:

$$1 + 1 \quad 2 + 2 \quad 3 + 3 \quad 4 + 4 \quad 5 + 5$$

Shuffle all the cards used in this section and repeat.

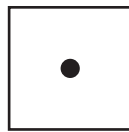
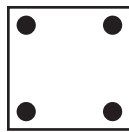
**Using addition to do conceptual subitizing.** Begin by showing two dot cards so the grouping is done for the students and have students tell you the total number of dots. Then tell students the strategy for each example. EXAMPLES:



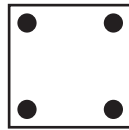
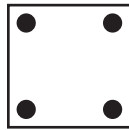
Strategy: One more than 3 is 4.

Strategy: Two more than 3 is 5.

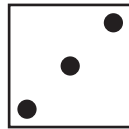
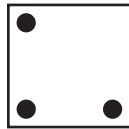




Strategy: One more than 4 is 5.



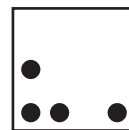
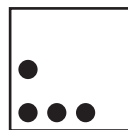
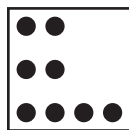
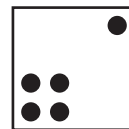
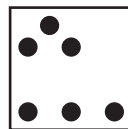
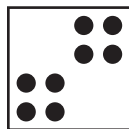
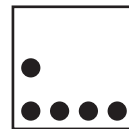
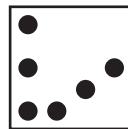
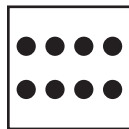
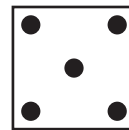
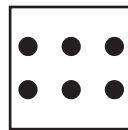
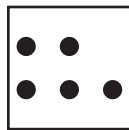
Strategy: Two groups of 4 is 8.



Strategy: Two groups of 3, even two different groups of 3, is 6.

Elicit more such strategies students can use to find the total, such as: I know it's 5 because I see a group of 2 and a group of 3; I know it's 4 because I see two groups of 2, or I see 3 and one more; I see two groups of 4 so that is 8.

Show one card so that students have to see the groups of dots on that card themselves. ASK: How did you group the dots? Did anyone group the dots in exactly the same way? Did anyone group the dots a different way? Allow different volunteers to show how they grouped the dots on each card (even when students all see the same numbers grouped, such as two groups of 4, they might be grouping the dots differently). Shuffle the following dot cards and show them in different orientations:



Some students may use additional strategies not reviewed in this lesson.

**Word problems practice.** SAY: When you can add by just knowing the answer, you can focus on the problem you are asked to do instead of having to think about how to do the addition.

**Exercises:** Solve the problem.

- a) There are 3 school buses and 2 city buses. How many buses altogether?
- b) There are 4 children jumping. 1 more child joins. Now how many children are jumping?
- c) There is 1 monkey climbing a tree. 1 more monkey climbs the tree. Now how many monkeys are climbing the tree?
- d) 2 children are playing. 2 more children join them. Now how many children are playing?
- e) There is 1 red crayon and 3 blue crayons. How many crayons are there?
- f) Jane sees 4 ravens and 4 eagles. How many birds does she see altogether?

**Answers:** a) 5, b) 5, c) 2, d) 4, e) 4, f) 8

## Extensions

- 1. Give each student or student pair two dice. If playing in pairs, students take turns rolling the dice. Next, they order the dice so the higher number is first, then they count on using the second number to find the total. For example, if they roll 6 and 4, students point to the die showing 6 and say “6” and then continue counting as they point to each dot on the die showing 4 and say “7, 8, 9, 10.”
- 2. Practise subitizing with addition cards that add to 6, including  $2 + 4$ ,  $4 + 2$ ,  $5 + 1$ , and  $1 + 5$ .
- 3. Use addition cards involving three numbers and have students say how they grouped the numbers. **EXAMPLE:**  $2 + 1 + 1$  (I know that  $2 + 1$  is 3 and  $3 + 1$  is 4; I know that  $1 + 1$  is 2 and  $2 + 2$  is 4).
- 4. Solve the word problem.
  - a) John sees 2 eagles, 1 raven, and 2 hawks. How many birds does John see?
  - b) Zara sees 1 eagle, 1 raven, 1 hawk, and 1 robin. How many birds does Zara see?

**Answers:** a) 5, b) 4

# NS1-77 Subtraction Facts

Page 68

## CURRICULUM REQUIREMENT

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

## VOCABULARY

left  
subtract  
subtraction  
take away

## Goals

Students will subitize up to five objects in different groupings and develop fluency in subtracting within 5.

## PRIOR KNOWLEDGE REQUIRED

Can count to 5  
Can subtract within 5 using objects or pictures

## MATERIALS

subtraction cards (see unit introduction)

**NOTE:** When practising subitizing with subtraction cards in this lesson, follow these steps with each set of cards. Hold up each card for two seconds, hide the card, and have students signal thumbs up when they have an answer. Invite volunteers to share their answers. Ask the volunteers how they knew the answer to help other students understand their strategy. Use each sequence of cards first in order, then in random order until all students can answer confidently.

**Subtracting 0.** Practise subitizing with the following subtraction cards:

$1 - 0$        $2 - 0$        $3 - 0$        $4 - 0$        $5 - 0$

**Subtracting to get 0.** Practise subitizing with the following subtraction cards:

$1 - 1$        $2 - 2$        $3 - 3$        $4 - 4$        $5 - 5$

Shuffle all the cards used so far and repeat.

**Subtracting 1 using one less than.** Elicit the strategy that subtracting 1 is the same as finding one less than a number using the following subtraction cards:

$1 - 1$        $2 - 1$        $3 - 1$        $4 - 1$        $5 - 1$

**Subtracting 2 using two less than.** Elicit the strategy that subtracting 2 is the same as finding two less than a number using the following subtraction cards:

$2 - 2$        $3 - 2$        $4 - 2$        $5 - 2$

**Subtracting using addition.** ASK: A group of 2 and a group of 3 is how many? (5) Draw on the board:



ASK: If you take away the group of 2 from the group of 5, what group are you left with? (the group of 3) If you take away the group of 3 from the group of 5, what group are you left with? (the group of 2) Write the following on the board and invite volunteers to fill in the blanks:

$$\begin{array}{lll} 2 + 3 = \_\_\_ & 1 + 3 = \_\_\_ & 2 + 2 = \_\_\_ \\ 1 + 4 = \_\_\_ & 1 + 2 = \_\_\_ & 3 + 2 = \_\_\_ \\ 1 + 1 = \_\_\_ & 3 + 3 = \_\_\_ & 4 + 4 = \_\_\_ \end{array}$$

Then use the following subtraction cards in order. Have volunteers say, each time, which addition on the board they could use to help them find the answer.

$$\begin{array}{llllll} 5 - 4 & 4 - 2 & 3 - 1 & 8 - 4 & 3 - 2 & 4 - 1 \\ 2 - 1 & 4 - 3 & 5 - 1 & 5 - 2 & 6 - 3 & 5 - 3 \end{array}$$

Shuffle all the cards you made for this lesson and repeat. Have different volunteers provide strategies for each card. ASK: How did you get the answer? Did anyone use exactly the same way? Did anyone use a different way?

**Word problems practice.** SAY: When you can subtract by just knowing the answer, you can focus on the problem you are asked to do instead of having to think about how to do the subtraction.

**Exercises:** Solve the subtraction problem.

- There are 5 school buses in the parking lot. 2 school buses leave the parking lot. How many buses are still there?
- There are 4 children jumping. 1 child stops jumping. Now how many children are jumping?
- 5 children are playing. 3 children stop playing. Now how many children are playing?

**Answers:** a) 3, b) 3, c) 2

SAY: When doing word problems, sometimes you have to add and sometimes you have to subtract. You have to decide which one to do for each problem.

**Exercises:** Do the addition or subtraction without pencil or paper.

- 5 bunnies hop. 3 bunnies stop. How many bunnies are still hopping?
- There are 3 bunnies jumping. There are 3 monkeys jumping. How many animals are jumping?
- There are 6 bunnies hopping. 3 bunnies leave to go shopping. Now how many bunnies are hopping?
- 8 bunnies are having a meeting. 4 bunnies leave and start eating. How many bunnies are still meeting?

- e) There are 2 bunnies jump, jump, jumping and 3 bunnies thump, thump, thumping. How many bunnies altogether?
- f) Jane sees 5 birds. 1 is a raven and the rest are eagles. How many eagles does Jane see?

**Answers:** a) 2, b) 6, c) 3, d) 4, e) 5, f) 4

## Extensions

- Practise subitizing with subtraction cards starting with 6, including  $6 - 0$ ,  $6 - 1$ ,  $6 - 2$ ,  $6 - 3$ ,  $6 - 4$ ,  $6 - 5$ ,  $6 - 6$ .
- Give each student or student pair two dice. If playing in pairs, students take turns rolling the dice. Next, they order the dice so the higher number is first, then they use the numbers in order to write a subtraction sentence.
- Solve two-step word problems requiring addition and subtraction.
  - Iva sees 4 eagles and 1 raven. Then 2 of the birds hide. How many birds does she see now?
  - 5 birds are in a tree. 3 birds leave. 2 birds come back. Now how many birds are in the tree?

**Answers:** a) 3, b) 4

- I Have \_\_, Who Has \_\_?** Students play in groups of six. Use **BLM Game Cards** (p V-3) to make cards with a number from 0 to 5 on the top and one of the following subtractions on the bottom:  $5 - 0$ ,  $5 - 1$ ,  $5 - 2$ ,  $5 - 3$ ,  $5 - 4$ ,  $5 - 5$ . Make a set of cards for each group.

Give each group a set of cards and have them distribute the cards, one per student. The student with the card shown in the margin would begin by saying, “I have 0. Who has  $5 - 2$ ?” The person who has 3 on top would say, “I have 3. Who has [whatever is on the bottom of the card]?”

I have 5
Who has $5 - 2$ ?



# NS1-78 Using 5 to Add

Pages 69–70

## CURRICULUM REQUIREMENT

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

## VOCABULARY

add  
left over  
make 5

## Goals

Students will use pairs of numbers that add to 5 to add more than two numbers.

## PRIOR KNOWLEDGE REQUIRED

Knows pairs of numbers that add to 5  
Can complete addition problems where one addend is missing  
Can add 5 to a number less than 5

## MATERIALS

red and yellow counters  
addition cards A–N and dot cards A–K (see unit introduction)

**The equal sign between two addition sentences.** Explain that the equal sign (=) means is the same number as. For example, having four things and adding one more is the same number as having five things, or  $4 + 1 = 5$ . ASK: Is  $1 + 1 + 3$  the same number as  $4 + 1$ ? (yes) How do you know? (they both add to 5) Demonstrate with 5 red counters split into piles of 4 and 1, and 5 yellow counters split into piles of 1, 1, and 3. Write on the board:

$$1 + 1 + 3 = 5 \text{ and } 4 + 1 = 5 \text{ so } 1 + 1 + 3 = 4 + 1$$

**The analogy with language.** Explain that saying “my pencil is yellow and your shirt is yellow” is just like saying “ $4 + 1$  is 5 and  $1 + 1 + 3$  is 5.” SAY: Just as we can say “my pencil is the same colour as your shirt”—without saying which colour that is—we can say “ $4 + 1$  is the same number as  $1 + 1 + 3$ ,” without saying the total. We write this as  $4 + 1 = 1 + 1 + 3$ . Have students come up with more number sentences where both sides add to 5.

**Exercise:** Write 3 addition sentences where both sides add to 5.

**Sample answers:**  $1 + 1 + 1 + 1 + 1 = 2 + 3$ ,  $4 + 1 = 3 + 2$ ,  $3 + 2 = 2 + 3$

**Chains of equal signs.** Explain that instead of writing  $4 + 1 = 3 + 2$  and  $2 + 3 = 3 + 2$ , we can take a shortcut and write  $4 + 1 = 3 + 2 = 2 + 3$ . Then have volunteers continue the chain to make it as long as they can. Read the number sentence aloud (read the equal signs as “is the same number as”).

**Finding two numbers that make 5 in a list.** Start with three numbers on the board: 1 2 4. ASK: Does 1 make 5 with either of the next two numbers? (yes) Which one? (4) Circle the numbers that make 5, as shown below:

$$\textcircled{1} \ 2 \ \textcircled{4}$$

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Then try 1 2 3 and ask if 1 makes 5 with any of the other numbers.  
 ASK: What number not in the list makes 5 with 1? (4) PROMPT: Hold up one finger. How many are you not holding up? Draw an X below the 1 to emphasize that it's not one of the numbers we have to circle. Then look at the last two numbers—do they make 5? (yes) Circle the two numbers, as shown below:

✕ (2) (3)

**Exercises:** Circle the 2 numbers that make 5.

- a) 0 1 4      b) 0 2 5      c) 2 3 4      d) 4 3 1

**Bonus**

- e) 0 1 3 4      f) 1 2 4 5      g) 1 2 3 5      h) 2 3 4 5  
 i) 0 1 3 5      j) 5 3 1 0      k) 4 2 3 5

**Selected answers:** d) circle 4 and 1, Bonus: k) circle 2 and 3

**Finding missing addends when one addend is 5.** Write on the board:

$$4 + 1 + 3 = 5 + \underline{\quad}$$

Make three piles of counters (4, 1, and 3) and ask students how the number sentence on the board relates to the three piles. Ask a volunteer to circle the two numbers that make 5 and combine the piles that correspond to those numbers. ASK: What is left over? (3) Write the leftover number in the blank. SAY: We combined two piles, but we didn't change how many altogether. So the three piles we started with (point to  $4 + 1 + 3$ ) have the same number (point to the equal sign) as the two piles (point to  $5 + 3$ ).

**Exercises:** Find 2 numbers that make 5. Then find the missing number.

- a)  $3 + 4 + 1 = 5 + \underline{\quad}$   
 b)  $2 + 1 + 3 = 5 + \underline{\quad}$   
 c)  $3 + 4 + 2 = 5 + \underline{\quad}$

**Answers:** a) 4 and 1, 3; b) 2 and 3, 1; c) 3 and 2, 4

**Adding 5 to any number at most 5.** Review adding 5 to any number less than 5. As a reminder, you could hold up all the fingers on one hand and four on the other and have students identify the number of fingers you are holding up and the corresponding addition sentence ( $5 + 4 = 9$  because you are holding up 9 fingers altogether). Continue adding 5 to numbers less than 5 until students can answer automatically.

**Exercises:** Add.

- a)  $5 + 3$       b)  $2 + 5$       c)  $5 + 5$       d)  $1 + 5$       e)  $5 + 0$

**Answers:** a) 8, b) 7, c) 10, d) 6, e) 5

**Adding three numbers by using pairs that add to 5.** Write on the board:

$$4 + 1 + 3 = 5 + \underline{\quad} = \underline{\quad}$$

Students now have to combine the steps above: circle the numbers that add to 5 and write the remaining number, then add the remaining number to 5. SAY: You know  $4 + 1$  is equal to 5. Point to the first blank and ASK: What is left over? (3) Write “3” in the first blank. Ask a volunteer to add  $5 + 3$  and write the answer in the second blank.

**Exercises:** Circle the 2 numbers that make 5. Use 5 to add.

a)  $2 + 3 + 1 = 5 + \underline{\quad} = \underline{\quad}$       b)  $4 + 2 + 1 = 5 + \underline{\quad} = \underline{\quad}$

c)  $3 + 1 + 4 = 5 + \underline{\quad} = \underline{\quad}$       d)  $3 + 2 + 4 = \underline{\quad}$

e)  $4 + 3 + 1 = \underline{\quad}$       **Bonus:**  $2 + 3 + 2 = 5 + \underline{\quad} = \underline{\quad}$

**Answers:** a) 1, 6; b) 2, 7; c) 3, 8; d) 9, e) 8, Bonus: 2, 7

**Fluency practice.** Shuffle addition cards A–H you made for this lesson and show students the cards one at a time for two seconds each. Have students signal thumbs up when they have an answer, then have a volunteer say the answer. Repeat until all students are providing answers. Repeat with addition cards I–N, then dot cards A–E, and then dot cards F–K.

## Extensions

1. Draw lines to show two pairs of numbers that add to 5.

EXAMPLE:  $4 + 2 + 3 + 1$

a)  $4 + 2 + 1 + 3$       b)  $3 + 2 + 1 + 4$       c)  $2 + 3 + 3 + 2$

**Answers:** a) 4 and 1, 2 and 3; b) 3 and 2, 1 and 4; c) 2 and 3, 3 and 2

2. Have students complete **BLM Adding Many Numbers** (p P-46).
3. How many dots are on a regular die? What pairs adding to 5 can you find?

**Answer:** 21; yes: 1 and 4, 2 and 3

4. Add. Hint: Find pairs of numbers that add to 5.

a)  $2 + 1 + 3 + 4 + 2$       b)  $2 + 2 + 3 + 4 + 3$

c)  $1 + 2 + 3 + 4 + 5 + 5 + 4 + 3 + 2 + 1$

**Selected solution:** c) 1 + 4, 2 + 3, 4 + 1, 3 + 2, and two 5s, so skip count: 5, 10, 15, 20, 25, 30

**Answers:** a) 12, b) 14



# NS1-79 Pairs Adding to 10

Pages 71–72

## CURRICULUM REQUIREMENT

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

## VOCABULARY

addition sentence  
making 10  
pairs adding to 10

## Goals

Students will find many combinations of numbers that add to 10.

## PRIOR KNOWLEDGE REQUIRED

Knows that there are five fingers on each hand  
Can complete addition problems where one addend is missing

## MATERIALS

**BLM Pairs Adding to 10** (p P-47)  
**BLM Ten-Dot Dominoes** (p P-48)  
**BLM Ten Wins** (p P-49)  
number cards for 1 to 9, four of each card per student

**Using ten-frames to show pairs adding to 10.** Draw on the board:

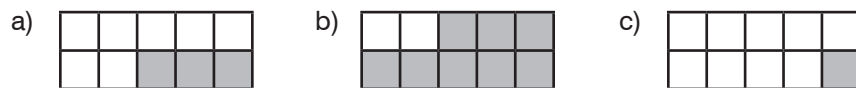


ASK: How many are not shaded? (6) Write “6” below the ten-frame.  
ASK: How many are shaded? (4) Write “4” to the right of the 6. ASK: How many in total? (10) Complete the addition sentence, as shown below:

$$6 + 4 = 10$$

SAY: If you add 6 and 4 you get 10, so we call 6 and 4 a pair adding to 10.

**Exercises:** How many are unshaded? How many are shaded? Write the addition sentence.



**Answers:** a) 7 unshaded and 3 shaded,  $7 + 3 = 10$ ; b) 2 unshaded and 8 shaded,  $2 + 8 = 10$ ; c) 9 unshaded and 1 shaded,  $9 + 1 = 10$

**Using your fingers to make numbers less than 10.** Tell students to hold up five fingers using both hands. (They can show 5 on one hand and 0 on other hand.) Record the combinations on the board as shown in the margin.

left		right		
5	+	0	=	5
3	+	2	=	5
1	+	4	=	5
:		:		:



Encourage students to find as many combinations as possible. Then repeat with at least two of 6, 7, 8, or 9 fingers. Challenge students to find combinations that they cannot show on their fingers. (EXAMPLE: Students can't show  $6 = 6 + 0$  or  $7 = 6 + 1$  because they do not have six fingers on one hand.)

**Finding missing addends (to 10) using the fingers on both hands.**

Hold up all your fingers on both hands. ASK: How many fingers do I have up? (10) Then hold up three fingers on your left hand and none on your right hand and SAY: How many fingers do I have up? (3) How many are not up on both hands? (7) What is  $3 + 7$ ? (10) How do you know? (there are 10 fingers on both hands) Repeat with several examples, including examples where either all or no fingers are held up. Then SAY: I want to know what number with 4 makes 10. Write on the board:  $4 + \underline{\quad} = 10$ . ASK: How could I use my 10 fingers? How many fingers should I hold up? (4) What does the number of fingers I'm not holding up tell me? (the missing number) Add labels to the number sentence and have a volunteer fill in the blank, as shown below:

$$\begin{array}{ccc} 4 & + & \underline{6} & = & 10 \\ \text{up} & & \text{not up} & & \end{array}$$

Complete more addition sentences this way, including sentences with 0 as an addend.

**Exercises:** Hold up the correct number of fingers on both hands to find the missing number.

- a)  $3 + \underline{\quad} = 10$       b)  $4 + \underline{\quad} = 10$       c)  $0 + \underline{\quad} = 10$   
 d)  $10 = 2 + \underline{\quad}$       e)  $10 = 5 + \underline{\quad}$       f)  $10 = 4 + \underline{\quad}$   
 g)  $10 = 0 + \underline{\quad}$

**Answers:** a) 7, b) 6, c) 10, d) 8, e) 5, f) 6, g) 10

Then give students problems where the first addend is missing, so that the number of fingers “not up” is given.

**Exercises:** Find the missing number.

- a)  $\underline{\quad} + 4 = 10$       b)  $\underline{\quad} + 2 = 10$       c)  $10 = \underline{\quad} + 3$   
 d)  $10 = \underline{\quad} + 2$       e)  $10 = \underline{\quad} + 5$       f)  $\underline{\quad} + 0 = 10$

**Answers:** a) 6, b) 8, c) 7, d) 8, e) 5, f) 10

**EXTRA PRACTICE****BLM Pairs Adding to 10**

**Answers:** 9, 1; 5, 0; 6, 4; 8, 2

**BLM Ten-Dot Dominoes**

**Answers:** 3, 5, 8, 6, 1, 2, 4

**BLM Ten Wins**

**Answers:** 3, 5, 2, 4, 6

**ACTIVITIES 1–2 (Optional)**

1. Play **Modified Go Fish** with target 5 (see Introduction, p A-51).
2. **A solitaire game.** Give each student four of each number card from 1 to 9. Students shuffle the cards and turn over the first eight cards, putting them face up in two rows of four cards. They make a pile from the rest of the cards. They take another card from the pile—if it makes 10 with any of the cards that are face up, they place it on that card; otherwise they discard it. Students continue until they have gone through all the cards, then repeat with the cards in the discard pile, adding them, where possible, to any of the piles that are face up. Students go through the discard pile as many times as they can, and try to use up all the cards.

**Subtracting from 10.** Hold up four fingers on your left hand and none on your right hand and ASK: How many fingers do I have up? (4) How many are not up on both hands? (6) What is  $4 + 6$ ? (10) Then hold up all 10 fingers on both hands and SAY: I have 10 fingers up. Write “10” on the board. SAY: I am going to put down six fingers and write “– 6” beside 10. Put down all the fingers on your right hand and one finger on your left hand. ASK: How many fingers are up? (4) Write “= 4” to complete the subtraction sentence on the board, as shown below:

$$10 - 6 = 4$$

Explain to students that they can use pairs adding to 10 to subtract from 10.

**Exercises:** Subtract by using pairs adding to 10.

- a)  $10 - 3$       b)  $10 - 8$       c)  $10 - 5$       d)  $10 - 1$

**Answers:** a) 7, b) 2, c) 5, d) 9

## Extensions

1. Circle the sentences that are not correct.

$$5 + 5 = 10 \quad 6 + 4 = 10 \quad 8 + 3 = 10 \quad 9 + 1 = 10 \quad 6 + 5 = 10$$

**Answer:**  $8 + 3 = 10$  and  $6 + 5 = 10$  are not correct.

2. Find the missing number.

a)  $3 + 2 + \underline{\quad} = 10$

b)  $4 + 2 + \underline{\quad} = 10$

c)  $1 + 2 + \underline{\quad} = 10$

**Bonus:**  $1 + 1 + 1 + \underline{\quad} = 10$

**Answers:** a) 5, b) 4, c) 7, Bonus: 7

# NS1-80 Using 10 to Add

Pages 73–74

## CURRICULUM REQUIREMENT

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

## VOCABULARY

addition sentence  
left over  
make 10  
pairs adding to 10

## Goals

Students will use pairs of numbers that add to 10 to add more than two numbers.

## PRIOR KNOWLEDGE REQUIRED

Knows pairs of numbers that add to 10  
Can complete addition problems where one addend is missing  
Can add 10 to a number less than 10

## MATERIALS

counters  
addition cards and dot cards (see unit introduction)

**Finding two numbers that make 10 in a list.** Start with three numbers on the board: 1 2 9. ASK: Does 1 make 10 with either of the next two numbers? (yes) Which one? (9) Circle the numbers that make 10, as shown below:

(1) 2 (9)

Then try 1 2 8 and ask if 1 makes 10 with any of the other numbers. ASK: What number not in the list makes 10 with 1? (9) PROMPT: Hold up one finger. How many are you not holding up? Draw an X below the 1 to emphasize that it is not one of the numbers we have to circle. Then look at the last two numbers—do they make 10? (yes; circle them).

X (2) (8)

Repeat with more lists of numbers, first having volunteers work at the board and then having students work individually.

**Exercises:** Circle the 2 numbers that make 10.

a) 6 1 4      b) 0 2 8      c) 7 3 4      d) 4 3 6

## Bonus

e) 0 7 3 4      f) 5 2 4 5      g) 1 2 9 5      h) 6 3 4 5  
i) 3 1 3 9      j) 5 3 1 7      k) 4 2 3 8

**Selected answers:** d) circle 4 and 6, Bonus: k) circle 2 and 8

**Finding missing addends when one addend is 10.** Write on the board:

$$9 + 1 + 3 = 10 + \underline{\quad}$$

Make three piles of counters (9, 1, and 3) and ask students how the number sentence on the board relates to the three piles. Ask a volunteer to circle the two numbers that make 10 and combine the piles that correspond to

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those numbers. ASK: What is left over? (3) Write the leftover number in the blank. Ask volunteers to help you solve more such problems.

**Exercises:** Find 2 numbers that make 10. Then find the missing number.

a)  $3 + 4 + 7 = 10 + \underline{\quad}$

b)  $2 + 1 + 9 = 10 + \underline{\quad}$

c)  $3 + 4 + 6 = 10 + \underline{\quad}$

**Answers:** a) 4, b) 2, c) 3

**Adding 10 to any number up to 10.** Review adding 10 to any number less than 10. As a reminder, you could ask a volunteer to hold up all the fingers on both hands and you can hold up four fingers on one of your hands and have students identify the number of fingers you and the volunteer are holding up together. ASK: How many fingers does [volunteer] have up? (10) Explain to students that to count the total number of fingers they can count on from 10 and just count the number of fingers you held up. Ask another volunteer to write the corresponding addition sentence. ( $10 + 4 = 14$  because you are holding up 14 fingers altogether) Continue adding 10 to numbers less than 10 until students can answer automatically.

**Exercises:** Add.

a)  $10 + 3$

b)  $2 + 10$

c)  $5 + 10$

d)  $7 + 10$

e)  $9 + 10$

f)  $0 + 10$

**Answers:** a) 13, b) 12, c) 15, d) 17, e) 19, f) 10

**Adding three numbers by using pairs adding to 10.** Write on the board:

$$9 + 1 + 3 = 10 + \underline{\quad} = \underline{\quad}$$

Students now have to combine the two steps above: circle the numbers that add to 10 and write the remaining number, then add the remaining number to 10. SAY: You know  $9 + 1$  is equal to 10. Point to the first blank and ASK: What is left over? (3) Write “3” in the first blank. Ask a volunteer to add  $10 + 3$  and write the answer in the second blank. (13)

**Exercises:** Circle the 2 numbers that make 10. Use 10 to add.

a)  $7 + 3 + 1 = 10 + \underline{\quad} = \underline{\quad}$

b)  $4 + 2 + 6 = 10 + \underline{\quad} = \underline{\quad}$

c)  $3 + 8 + 2 = 10 + \underline{\quad} = \underline{\quad}$

d)  $6 + 9 + 4 = \underline{\quad}$

e)  $5 + 3 + 7 = \underline{\quad}$

**Bonus:**  $2 + 8 + 2 = 10 + \underline{\quad} = \underline{\quad}$

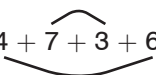
**Answers:** a) 1, 11; b) 2, 12; c) 3, 13; d) 19; e) 15; Bonus: 2, 12

**Fluency practice.** Use the addition cards you made for this lesson and show students the cards one at a time for two seconds each. Start with cards adding 10 (shuffled), and then move to cards that add three numbers, and then move to the dot cards. Have students signal thumbs up when they have an answer, then have a volunteer say the answer. Repeat until all students are providing answers.

## Extensions

1. Draw lines to show 2 pairs of numbers that add to 10.

EXAMPLE:  $4 + 7 + 3 + 6$



- a)  $9 + 2 + 1 + 8$                       b)  $6 + 5 + 5 + 4$   
c)  $2 + 8 + 8 + 2$                       d)  $7 + 1 + 9 + 3$

**Answers:** a) 9 and 1, 2 and 8; b) 6 and 4, 5 and 5; c) 2 and 8, 8 and 2;  
d) 7 and 3, 1 and 9

2. Add. Hint: Find pairs that add to 10.

- a)  $2 + 4 + 8 + 6 + 7$   
b)  $2 + 5 + 3 + 7 + 5$   
c)  $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1$

**Answers:** a) 27, b) 22, c) 90

# NS1-81 Making 10 to Add

Pages 75–76

## CURRICULUM REQUIREMENT

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

## VOCABULARY

add  
count on

## 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 count within 20  
Understands that dividing a group into parts does not change the original quantity  
Knows pairs adding to 10

## MATERIALS

**BLM Making 10 to Add** (p P-50)  
**BLM Ten-Frames** (p V-2) or an overhead projector and a transparency of **BLM Ten-Frames** (p V-2)  
15 counters

**Adding 10 is easier than adding one-digit numbers.** On the board, write the following sums in a row and have students solve them mentally. Students can count on their fingers.

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

Write the answers, and then hide the above addition sentences. Next, write the following additions in a row below the hidden sentences, and have students solve them mentally. Again, students can count on their fingers.

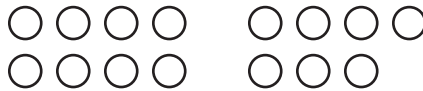
$$10 + 5 = \quad 10 + 7 = \quad 10 + 4 = \quad 10 + 1 = \quad 10 + 2 =$$

Uncover the hidden sentences. Discuss why adding a one-digit number to 10 (as in the second row) is easier than adding any of the one-digit additions (as shown in the first row) even though adding bigger numbers is usually harder than adding smaller numbers. 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. (Write the answers on the board as you say them.) When you add  $10 + 2$ , you get 12. There is a pattern that makes it easy; you just write 1 and then the number you are adding. Have students continue saying the pattern up to  $10 + 9 = 19$ .

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



Have students count the circles in each group. Write “8” and “7” above the groups. Write a plus sign between the numbers. Have students count all the circles and say the total. (15) Write “= 15.” The picture should look like this:

$$\begin{array}{ccccccc} 8 & & + & & 7 & & = & 15 \\ \begin{array}{c} \bigcirc \bigcirc \bigcirc \bigcirc \\ \bigcirc \bigcirc \bigcirc \bigcirc \end{array} & & & & \begin{array}{c} \bigcirc \bigcirc \bigcirc \bigcirc \\ \bigcirc \bigcirc \bigcirc \end{array} & & & \end{array}$$

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. (10, 5) Write “10” and “5.” ASK: Did making the group of 10 circles change the total? (no) Explain that, because grouping 10 circles didn’t change the total number,  $8 + 7$  and  $10 + 5$  must both add up to the same number. Write a plus sign between the numbers and ASK: What is  $10 + 5$ ? (15) How did you get that? (I counted on from 10; I used the pattern for adding 10) Write “= 15.” The final picture should look like this:

$$\begin{array}{ccccccc} 8 & & + & & 7 & & = & 15 \\ \begin{array}{|c|c|c|c|c|c|} \hline \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc \\ \hline \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc \end{array} & & & & \begin{array}{c} \bigcirc \bigcirc \bigcirc \\ \bigcirc \bigcirc \end{array} & & & \\ 10 & & + & & 5 & & = & 15 \end{array}$$

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

$$8 + 7 = 10 + 5$$

SAY: If I want to add  $8 + 7$  and I find  $10 + 5$  easier, I can add  $10 + 5$  instead.

Have students complete **BLM Making 10 to Add**. (2, 12; 2, 12; 1, 11; 3, 13; 4, 14)

**Fluency practice.** You will need two ten-frames from **BLM Ten-Frames** and 15 counters. You could do this with students at the carpet or on an overhead projector. Place 10 counters on one frame and 5 on the other and have students determine how many counters there are altogether. Show students the ten-frames for two seconds before covering them up. Have students signal when they have an answer. Invite volunteers to answer (15) and explain how they know (10 and 5 is 15).

Repeat with 9 on one frame and 1 on the other frame. Demonstrate moving the counter from the second frame to the first frame to complete the ten-frame. ASK: Did I change the number of counters by moving one to the other frame? (no) SAY: So, 9 and 1 is a complete 10. Repeat for 9 and 3, which is the same as 10 and 2, as is 12 counters, and 9 and 4 (same as 10 and 3, or 13), 9 and 2 (same as 10 and 1, or 11), and 9 and 5 (same as



10 and 4, or 14), always moving one counter to demonstrate the answer. You might show 9 and 4, for example, in different ways by putting the 9 or the 4 in different arrangements. When students can easily add to 9 by moving one from the second frame to the first, you might place 8 counters on one frame and small numbers on the other frame, as a further challenge; they will need to move two counters mentally.

## Extensions

1. Draw a picture, then make a group of 10 to add.

a)  $7 + 6$       b)  $8 + 7$       c)  $6 + 9$       d)  $9 + 7$

**Answers:** a) 13, b) 15, c) 15, d) 16

2. Add.

a)  $20 + 4$       b)  $20 + 7$       c)  $20 + 3$       d)  $20 + 8$

**Answers:** a) 24, b) 27, c) 23, d) 28

3. a) Draw a picture to show  $15 + 8$ .

b) Make a group of 20 to add.

**Answer:** 23

4. a) Draw a picture to show  $8 + 6 + 6 + 7$ .

b) Make groups of 5, then count by 5s and 1s to add.

**Answer:** 27

5. Solve the addition by mentally moving 1 from the other number to the 9.

a)  $9 + 3$       b)  $9 + 7$       c)  $2 + 9$       d)  $9 + 9$

**Answers:** a) 12, b) 16, c) 11, d) 18

6. Solve the addition by mentally moving 2 from the other number to the 8.

a)  $8 + 5$       b)  $8 + 7$       c)  $3 + 8$       d)  $8 + 8$

**Answers:** a) 13, b) 15, c) 11, d) 16

# NS1-82 Patterns in Adding

Pages 77–78

## CURRICULUM REQUIREMENT

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

## VOCABULARY

addition sentence  
pair  
total

## Goals

Students will discover ways to find all the pairs of numbers that add to a given number.

## PRIOR KNOWLEDGE REQUIRED

Knows pairs that add to 5

## MATERIALS

**BLM Colouring Stars** (p P-51)  
counters  
cups  
connecting cubes (optional)

**Review finding pairs that add to 5 by using your fingers.** Have students hold up two fingers on one hand. ASK: How many fingers on that hand are not up? (3) How many fingers are there in total? (5) Have a volunteer write the number sentence for this. If a student says  $2 + 3 = 5$  explain to the class that the student is counting the number of fingers up first. ASK: What would we get if we counted the number of fingers that are not up first? ( $3 + 2 = 5$ )

**Using fingers to find all pairs that add to 5.** Write on the board:

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

SAY: Let's count the number of fingers that are up first. ASK: What are the possible numbers for the first blank? Can 6 be a first number? (no) Can we hold up six fingers on one hand? (no) 9? (no) 3? (yes) 7? (no) 4? (yes) List all the numbers that could be in the first blank. You may need to prompt for 0 or 5: Can I hold up no fingers? (yes) What number is that? (0) Can I hold up all my fingers? (yes) How many is that? (5) Then tell students that you want to write all the number sentences in an organized way. Write six number sentences that add to 5 with blanks (see margin).

ASK: What is the smallest number of fingers you can hold up on one hand? (0) What's the next smallest? (1) Continue to 5, then fill in the first blanks. ASK: How many fingers do I hold up for  $5 = 0 + \underline{\quad}$ ? (zero or none) Demonstrate doing this and ask how many you are not holding up. Then ask a volunteer to show how they would use their fingers to fill in the blank in the next number sentence:  $5 = 1 + \underline{\quad}$ . Repeat for all remaining number sentences on the board. ASK: Have we found all the pairs that add to 5? (yes) How do you know? (the number of fingers that we can hold up is between 0 and 5) Explain to students how writing the numbers in order can help make sure they do not miss any numbers.

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

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

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

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

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

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

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**Using colouring to find pairs adding to 5.** Draw five squares on the board and a chart with the headings “Coloured,” “Not Coloured,” and “Total.”

ASK: How many squares are coloured? (0) How many are not coloured? (5) How many squares are there in total? (5) Fill in the first row in the chart together: 0, 5, 5. Have volunteers colour one square at a time and repeat the questions to complete the chart together as a class. (Volunteers can colour the squares in any order, but it’s better to colour from left to right.)

**Exercise:** Complete **BLM Colouring Stars**.

**Answers:**  $1 + 9 = 10$ ,  $2 + 8 = 10$ ,  $3 + 7 = 10$ ,  $4 + 6 = 10$ ,  $5 + 5 = 10$ ,  $6 + 4 = 10$ ,  $7 + 3 = 10$ ,  $8 + 2 = 10$ ,  $9 + 1 = 10$ ,  $10 + 0 = 10$ . The total stayed the same because there are always 10 stars.

**Bonus:** Draw 7 objects in a row and colour one at a time to find all the pairs that add to 7.

**Comparing methods.** Look at the number sentences that add to 5. The first number starts at 0 and goes up by 1 each time. The second number starts at 5 and goes down by 1 each time. When you hold up one more finger, you add 1 to the number of fingers up and subtract 1 from the number of fingers that are not up; when you colour one more square, you add 1 to the number of squares that are coloured and subtract 1 from the squares that are not coloured.

### ACTIVITY 1 (Essential), ACTIVITIES 2–3 (Optional)

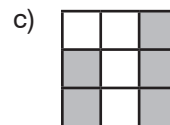
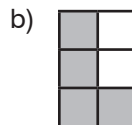
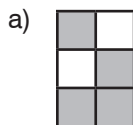
1. Give each student a pile of counters and a cup. Students move one counter at a time into the cup and write number sentences of the form Number in Cup + Number Not in Cup.
2. All students stand up. Students sit down one at a time. As the students sit down, they write the addition sentence based on Number Standing + Number Sitting on a card. Then collect the cards and display them as pairs adding to [total number of students].
3. Role-play a hide and seek game to find all the pairs adding to a given number. For example, to find all the pairs adding to 5, place five chairs at the front of the room (so that the students participating can see all the chairs too). Ask five volunteers to hide behind the chairs. Record the situation on the board as 5 (the number hiding) + 0 (the number sitting) = 5 (the number of children playing). Then have volunteers find one student at a time. As students are found, they sit on the chair they were hiding behind. Each time, record the new number sentence on the board. Repeat for various numbers of children playing, with different volunteers each time. Alternatively, pretend a chain of connecting cubes are the children hiding. As you pretend to find one more child, break one cube off the chain at a time, and record the resulting number sentences.

## Extensions

1. Complete **BLM Patterns in Adding on Number Lines** (p P-52).

**Answers:**  $1 + 4 = 5$ ,  $2 + 3 = 5$ ,  $3 + 2 = 5$ ,  $4 + 1 = 5$ ,  $5 + 0 = 5$ ; total; goes down by 1

2. Count the shaded squares in each row and write an addition sentence for the total number of shaded squares. Count the shaded squares in each column and write another addition sentence for the total number of shaded squares.



**Answers:** a)  $1 + 1 + 2 = 2 + 2$ , b)  $1 + 1 + 2 = 3 + 1$ ,  
c)  $1 + 2 + 2 = 2 + 0 + 3$

3. Find patterns in the following subtraction sentences.

$$\begin{aligned} 5 - 0 &= 5 \\ 5 - 1 &= 4 \\ 5 - 2 &= 3 \\ 5 - 3 &= 2 \\ 5 - 4 &= 1 \\ 5 - 5 &= 0. \end{aligned}$$

**Answers:** the first number stays the same, the number being subtracted goes up by 1, and the answer goes down by 1.

4. List all the pairs of numbers that add to the given number.

a) 3                      b) 4                      c) 5                      d) 6

5. Use your answers to Extension 4 to write how many pairs of numbers add to 3, 4, 5, and 6. Then predict how many pairs of numbers will add to 7. Check your prediction.

# NS1-83 One More, One Less

Pages 79–81

## CURRICULUM REQUIREMENT

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

## VOCABULARY

one less than  
one more than

## Goals

Students will use combinations of numbers that add to 5 or 10 to find sums that are one more or one less than 5 or 10.

## PRIOR KNOWLEDGE REQUIRED

Can find pairs that add to 5 and 10

## MATERIALS

small ball or wad of paper  
counters  
addition cards (see unit introduction)

**Review “one more than.”** Have student volunteers determine numbers that are “one more than” various numbers to 10. You could do this by playing Catch. You will need a small ball or a wad of paper that students can catch easily. Toss the ball to a student while saying a number. The student catches the ball and repeats the number. The student then tosses the ball back to you and says the number that is one more than the number you threw to them). Ensure that everyone gets a chance to play.

**One more than 5 or 10.** Give each student at least 11 counters. Tell students to make a pile of 4 and another pile of 6. ASK: How many counters are in both piles together? (10) How do you know? (4 and 6 make 10) Have a student write the addition sentence on the board. ( $4 + 6 = 10$ ) Then tell students to take one more counter and put it in one of their piles. ASK: How many counters do you have now in the two piles? (11) How do you know? (I had 10 and then added one more, and one more than 10 is 11.) Some students might count out the 11. If so, ASK: Could you have predicted that? You had 10 and added one more—what number is one more than 10? (11) Have different volunteers write the addition sentence to show their new piles. ( $5 + 6 = 11$  or  $4 + 7 = 11$ ) ASK: How many people have  $5 + 6 = 11$ ? How many people have  $4 + 7 = 11$ ? Did anyone get anything else? (no) Explain that if students added a counter to the first pile, they would get  $5 + 6$  because 5 is one more than 4; if they added a counter to the second pile, they would get  $4 + 7$  because 7 is one more than 6. Repeat with various pairs of piles that have either 5 or 10 counters in total so that the new piles have either 6 or 11 in total.

**One less than 5 or 10.** Repeat the above exercise, but ask students to remove a counter from one of the piles instead of adding to a pile.

**Using a model.** Draw on the board a model for  $5 + 5 = 10$  and have students identify the corresponding addition sentence, as shown below:

$$\begin{array}{ccccccccc} \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc & & \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc \\ 5 & & & & & + & & & & 5 & = 10 \end{array}$$

Then add a circle to one of the groups and ask a volunteer to write the new addition sentence, as shown below:

$$\begin{array}{ccccccc} \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bullet & & \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc & & \\ 6 & & & & & & + & & & & 5 & & = 11 \end{array}$$

Repeat, but add the circle to the other group. Emphasize that it doesn't matter which group you add the circle to—you are still increasing the total number of circles by one. Repeat for  $8 + 2 = 10$  and  $4 + 1 = 5$ , allowing volunteers to draw the models and write the sentences. Then do examples of taking away one circle (by erasing or crossing it out). EXAMPLE:

$$\begin{array}{ccccccc} \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc & & \bigcirc & \bigcirc & \bigcirc & \bigcirc & \bigcirc & & \\ & & & & & & & & & & & & & \end{array}$$

**One more or one less.** Write on the board:  $7 + 3 = 10$ . Have students use this fact to solve the following problems  $6 + 3$ ,  $7 + 4$ ,  $8 + 3$ ,  $7 + 2$ . Prompt students as required. (EXAMPLES: Is  $6 + 3$  one more or one less than  $7 + 3$ ? How do you know? How much is  $6 + 3$ ?) Then write  $8 + 2 = 10$  and have students solve these problems:  $8 + 1$ ,  $9 + 2$ ,  $8 + 3$ ,  $7 + 2$ . Now write  $3 + 2 = 5$  and ask students to write and then solve all the addition problems that are one more or one less than the given problem. Repeat with  $5 + 5 = 10$ . Finally, have students solve problems by first determining numbers that add to 5 or 10. EXAMPLES:  $5 + 6$  (that's one more than  $5 + 5$  or  $4 + 6$ , so  $5 + 6 = 11$ ),  $4 + 2$ ,  $3 + 3$ ,  $7 + 4$ ,  $2 + 7$ ,  $9 + 2$ ,  $2 + 2$ ,  $3 + 1$ .

**Fluency practice.** Use the addition cards you made for this lesson. Write on the board:

$$4 + 6 = 10$$

Then show students the following cards, one at a time:  $5 + 6$ ,  $4 + 7$ ,  $3 + 6$ , and  $4 + 5$ . Have students signal thumbs up when they know the answer, then have a volunteer say the answer. Then show the card  $3 + 8$  and again have students signal when they know the answer. After a volunteer gives the answer, ASK: What pair adding to 10 is  $3 + 8$  close to? ( $2 + 8$  or  $3 + 7$ ) Did anyone use a different pair? ( $3 + 7$  or  $2 + 8$ ) Repeat for the remaining cards, in random order.

## Extensions

1. **Two more and two less.** Make two piles of counters. Teach students to find “two more than” by adding one to each of two piles, or two to one pile. (EXAMPLES: If  $6 + 4 = 10$ , then  $8 + 4 = 12$ . If  $7 + 3 = 10$ , adding 1 to each pile gives  $8 + 4 = 12$ .) Similarly, remove one from each pile or two from one pile to find “two less than.”
2. Challenge students to list all the sentences that are one more than, one less than, two more than, or two less than  $6 + 4 = 10$ .

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

# NS1-84 Pairs Adding to 20

Pages 82–83

## CURRICULUM REQUIREMENT

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

## VOCABULARY

addition sentence  
double ten-frame  
pairs adding to 10  
pairs adding to 20

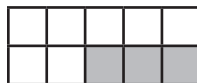
## Goals

Students will find pairs that add to 20 using double ten-frames and then using addition sentences.

## PRIOR KNOWLEDGE REQUIRED

Can count on from a one-digit number  
Can count within 20  
Can add 10 to any number less than 10

**Review using ten-frames to show pairs adding to 10.** Draw on the board:

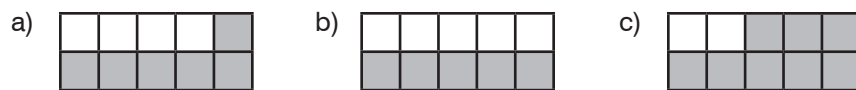


ASK: How many squares are not shaded? (7) How many are shaded? (3)  
How many in total? (10) Write the addition sentence, as shown below:

$$7 + 3 = 10$$

Remind students that 7 and 3 are a pair adding to 10. Keep the picture on the board for later use.

**Exercises:** How many are unshaded? How many are shaded? Write the addition sentence.



**Answers:** a) 4 unshaded and 6 shaded,  $4 + 6 = 10$ ; b) 5 unshaded and 5 shaded,  $5 + 5 = 10$ ; c) 2 unshaded and 8 shaded,  $2 + 8 = 10$

**Using double ten-frames to show pairs adding to 20.** Draw on the board:



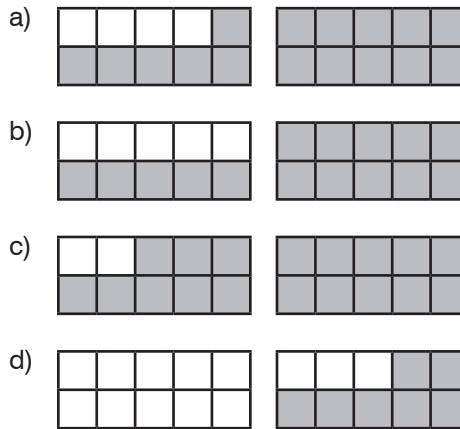
Point to the frames and SAY: We call this a double ten-frame because it has two ten-frames. ASK: How many squares are not shaded? (7) How many are shaded? (13) How many in total? (20) How do you know? (20 is 2 tens) Write the addition sentence underneath the double ten-frame, as shown below:



$$7 + 13 = 20$$

SAY: If you add 7 and 13 you get 20, so we call 7 and 13 a pair adding to 20.

**Exercises:** How many are unshaded? How many are shaded? Write the addition sentence for each picture.

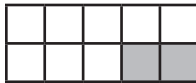


**Answers:** a) 4 unshaded and 16 shaded,  $4 + 16 = 20$ ; b) 5 unshaded and 15 shaded,  $5 + 15 = 20$ ; c) 2 unshaded and 18 shaded,  $2 + 18 = 20$ ; d) 13 unshaded and 7 shaded,  $13 + 7 = 20$

**Using pairs adding to 10 to write addition sentences adding to 20.**

Write on the board:

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



so  $8 + \underline{\quad} = 20$

Ask a volunteer to fill in the first blank. (2) SAY: In the ten-frame, eight squares are unshaded, and two squares are shaded. If we add a shaded ten-frame, we have a double ten-frame. Draw on the board:



ASK: How many squares are in the ten-frame we added? (10) How many squares are in the double ten-frame? (20) How many do you have to add to 10 to get 20? (10) Point to the 2 that the volunteer wrote in the blank and the two shaded squares of the double ten-frame. ASK: What do you get if you add 10 to 2? (12) Write "12" in the other blank.

Point to the top ten-frame and SAY:  $8 + 2$  is 10. Now point to the double ten-frame and SAY: So  $8 + 12$  is 20, because 12 is 10 more than 2, and 20 is 10 more than 10.



**Exercises:** Use the addition that makes 10 to fill in the addition that makes 20.

a)  $4 + \underline{\quad} = 10$       b)  $8 + \underline{\quad} = 10$       c)  $1 + \underline{\quad} = 10$   
 so  $4 + \underline{\quad} = 20$       so  $8 + \underline{\quad} = 20$       so  $1 + \underline{\quad} = 20$

**Answers:** a) 6, 16; b) 2, 12; c) 9, 19

**Pairs adding to 20.** Write on the board:

$7 + \underline{\quad} = 10$   
 so  $17 + \underline{\quad} = 20$

Ask a volunteer to fill the first blank. (3) ASK: How many more than 10 is 20? (10) How many more than 7 is 17? (10) Draw on the board:



SAY:  $7 + 3$  is 10, so  $17 + 3$  is 20, because 17 is 10 more than 7 and 20 is 10 more than 10. Write “3” in the second blank, as shown below:

$7 + \underline{3} = 10$   
 so  $17 + \underline{3} = 20$

**Exercises:** Complete the addition sentences.

a)  $8 + \underline{\quad} = 10$       b)  $3 + \underline{\quad} = 10$       c)  $1 + \underline{\quad} = 10$   
 so  $18 + \underline{\quad} = 20$       so  $13 + \underline{\quad} = 20$       so  $11 + \underline{\quad} = 20$

**Answers:** a) 2, 2; b) 7, 7; c) 9, 9

## Extensions

1. Circle the sentences that are not correct.

$5 + 15 = 20$      $16 + 4 = 20$      $8 + 13 = 20$      $9 + 11 = 20$      $6 + 15 = 20$

**Answer:**  $8 + 13 = 20$  and  $6 + 15 = 20$  are not correct.

2. Find the missing number.

a)  $13 + 2 + \underline{\quad} = 20$       b)  $4 + 12 + \underline{\quad} = 20$   
 c)  $2 + 5 + \underline{\quad} = 20$       **Bonus:**  $1 + 1 + 1 + \underline{\quad} = 20$

**Answers:** a) 5, b) 4, c) 13, Bonus: 17

3. Add the 3 numbers by finding the pair that makes 20.

a)  $17 + 3 + 2$       b)  $4 + 16 + 3$   
 c)  $12 + 9 + 8$       d)  $5 + 7 + 15$

**Answers:** a) 22 with the pair 17 and 3, b) 23 with the pair 4 and 16, c) 29 with the pair 12 and 8, d) 27 with the pair 5 and 15

4. How much more than 20? Add.

- a)  $17 + 4$       b)  $6 + 15$       c)  $13 + 9$       d)  $4 + 18$

**Answers:** a) 1 more, 21; b) 1 more, 21; c) 2 more, 22; d) 2 more, 22

5. a) Ronin has 20 berries. He eats 16 of them. How many berries does he have left?

b) Jayden has 20 stickers. He gives 6 to Vicky. He keeps the rest. Who has more stickers now?

c) Jeri has 20 crayons. She breaks 10 red crayons and 3 blue crayons. How many crayons are not broken?

**Bonus:** Randi has 20 carrots. She gives 10 to Zack, 5 to Marko and 2 to Bella. How many carrots does she have left?

**Answers:** a) 4, b) Jayden, c) 7, Bonus: 3

# NS1-85 Doubles within 20

Pages 84–85

## CURRICULUM REQUIREMENT

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

## VOCABULARY

double

## Goals

Students will use the double of 5 to double other numbers.

## PRIOR KNOWLEDGE REQUIRED

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

## MATERIALS

6 loonies  
paper counters  
counters  
**BLM What Is the Double?** (p P-53)  
dot cards and addition cards (see unit introduction)

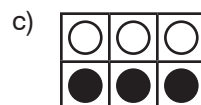
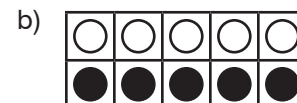
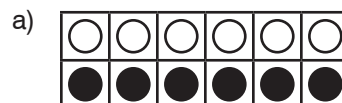
**Introduce “double.”** ASK: Does anyone know the word double? What does it mean? (add the same number to the number you have) If I have three loonies and I double the number of loonies, how many will I have? (6) Demonstrate counting out three loonies and then three more. Explain that if you have double, that means you have the same number again. Tape paper counters to the board to demonstrate this. Show two counters and SAY: Now I’m going to double my counters, so if I start with two, I need to add two more. Put two more counters on the board. ASK: How many do I have now? (4) Write on the board:

4 is the double of 2.

Repeat with other examples, always emphasizing the word double and using pictures or concrete objects to illustrate the doubling.

**Writing addition sentences to show doubles.** SAY: We get the double of a number by adding a number to itself, so the double of 3 is  $3 + 3 = 6$ . Give students counters. Have students write addition sentences to show the doubles of 4, 2, 5, 1, and 0.

**Exercises:** Write a doubles number sentence for the picture.



**Answers:** a)  $6 + 6 = 12$ , b)  $5 + 5 = 10$ , c)  $3 + 3 = 6$

## EXTRA PRACTICE

### BLM What Is the Double?

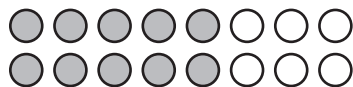
**Answers:** 8, 14, 0, 12, 2, 16, 4, 10, 18, 16, 10, 8, 14, 0, 18, 6, 4, 2, 12

Figure 1



$$8 = 5 + 3$$

so



$$\begin{aligned} 8 + 8 &= \underline{5 + 5} + \underline{3 + 3} \\ &= 10 + 6 \\ &= 16 \end{aligned}$$

**Doubling a number by creating two rows of the same number.** Tape 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? (6) How do you know? (I counted them all, I counted by 2s, I counted on from 3) Write on the board:

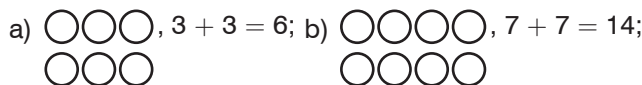
6 is the double of 3.

Repeat with doubling other numbers from 1 to 10.

**Exercises:** Double the number of circles. Write an addition sentence for your picture.



### Answers



**Using 5 to double.** Tell students you want to double the number 8 a different way. Draw a model for 8 with 5 coloured circles and 3 uncoloured circles. Now double 8—draw two rows of 8 circles and write the number sentence below it (see Figure 1).

**Review adding 10 to a one-digit number.** Discuss why 10 is particularly easy to add to other numbers. ASK: Why is doubling easier when you split the number into 5 plus another number? What is the double of 5 and why does that make it easier to work with? (the double of 5 is 10, which is easy to add to other numbers) Repeat with several examples. Then double some numbers this way without the model—just use the numbers:  $6 = 5 + 1$ , so  $6 + 6 = 10 + 2 = 12$ . Have students double more numbers this way.

**Exercises:** Double the number using 5.

a)  $8 = 5 + \underline{\quad}$ , so  $10 + \underline{\quad} = \underline{\quad}$

b)  $9 = 5 + \underline{\quad}$ , so  $10 + \underline{\quad} = \underline{\quad}$

**Bonus:**  $13 = 5 + \underline{\quad}$ , so  $10 + \underline{\quad} = \underline{\quad}$

**Answers:** a) 3, 6, 16; b) 4, 8, 18; Bonus 8, 16, 26

**Using 10 to double.** Have students fill in the blanks:  $13 = 10 + \underline{\quad}$ ,  $18 = 10 + \underline{\quad}$ ,  $16 = 10 + \underline{\quad}$ . Then use a model like the one in Figure 1 to double 13 using 10. Emphasize that this answer is the same as the bonus above. It doesn't matter how you double 13 (by thinking of it as  $5 + 8$  or  $10 + 3$ ), you still get the same answer. Have students practise using 10 to double various numbers.

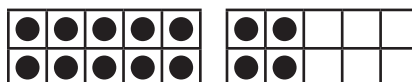
**Exercises:** Double the number using 10.

a)  $11 = 10 + \underline{\quad}$ , so  $20 + \underline{\quad} = \underline{\quad}$

b)  $14 = 10 + \underline{\quad}$ , so  $20 + \underline{\quad} = \underline{\quad}$

**Answers:** a) 1, 2, 22; b) 4, 8, 28

**Fluency practice.** Use the dot cards and addition cards you made for this lesson. Start with the dot cards, two ten-frames at a time, first in order (10 and 2, 10 and 4, 10 and 6, 10 and 8, 10 and 10), and then in random order. Place the two ten-frames beside each other with the full ten-frame always on the left and so that each row shows  $5 + 1$ ,  $5 + 2$ ,  $5 + 3$ ,  $5 + 4$ , or  $5 + 5$  dots. **EXAMPLE:**



Ask students how many dots there are altogether on both cards. Show them the cards for two seconds only, then hide the cards. Have students signal thumbs up when they know the answer, and then have volunteers say the answer and how they know. Repeat with the addition cards, first in order, and then in random order.

## Extensions

- Students will need small (1 cm) and large (2 cm) connecting cubes or blocks to complete **BLM Big Cubes and Small Cubes** (p P-54). Students will discover that the number of small cubes is double the number of large cubes for any given length.

**Answers:** 4, 8; 2, 4; 5, 10; double; 7

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

- Make the number using tens and ones blocks, then make double the number. What is the double?

a) 30      b) 20      c) 40      d) 21      e) 34      f) 42

**Answers:** a) 60, b) 40, c) 80, d) 42, e) 68, f) 84

# NS1-86 Using Doubles to Add

Pages 86–87

## CURRICULUM REQUIREMENT

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

## VOCABULARY

double

## Goals

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

## PRIOR KNOWLEDGE REQUIRED

Knows the doubles of numbers to at least 10  
Can complete number sentences where one number is missing  
Can add 10 to a one-digit number  
Can add three numbers  
Can find one more than and one less than

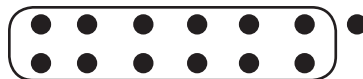
## MATERIALS

addition cards (see unit introduction)

**Review using pairs that make 10 to add.** EXAMPLES:  $8 + 3$  is one more than  $7 + 3$  (or  $8 + 2$ ) which is 10, so  $8 + 3$  is 11. Since  $7 + 2$  is one less than  $8 + 2$  (or  $7 + 3$ ), which is 10, then  $7 + 2$  is 9.

**Using given doubles to add.** Teach students to use doubles to add in the same way they used pairs that make 10. For example,  $3 + 4$  is one more than  $3 + 3 = 6$ , so  $3 + 4 = 7$ . Another example:  $7 + 6$  is one less than  $7 + 7$  (or one more than  $6 + 6$ ), so  $7 + 6 = 14 - 1 = 13$  (or  $12 + 1 = 13$ ). Draw a model to demonstrate this, as shown below:

$$7 + 6$$



$6 + 6$  is 12, so  $7 + 6$  is 13.

In the following exercises, students solve various problems of this sort.

## Exercises

1. Use the double to add 1.

a)  $4 + 4 = 8$ , so  $5 + 4 = \underline{\quad}$       b)  $5 + 5 = 10$ , so  $5 + 6 = \underline{\quad}$

c)  $7 + 7 = 14$ , so  $7 + 8 = \underline{\quad}$       d)  $8 + 8 = 16$ , so  $8 + 9 = \underline{\quad}$

**Answers:** a) 9, b) 11, c) 15, d) 17

**Bonus:** Use 2 or 3 more (or less) than to find  $5 + 7 = \underline{\quad}$ .

2. Use the addition sentence to add.

- a)  $4 + 6 = 10$ , so  $4 + 8 = \underline{\quad}$       b)  $7 + 3 = 10$ , so  $5 + 3 = \underline{\quad}$   
 c)  $6 + 6 = 12$ , so  $6 + 8 = \underline{\quad}$       d)  $8 + 2 = 10$ , so  $8 + 5 = \underline{\quad}$

**Answers:** a) 12, b) 8, c) 14, d) 13

**Finding the double before using it to add.** In the following exercises, students find the double and it use to find the sum.

**Exercises:** Find the double, then use it to add.

- 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  $9 + 8 = \underline{\quad}$       d)  $6 + 6 = \underline{\quad}$ , so  $7 + 6 = \underline{\quad}$

**Bonus**

- e)  $12 + 12 = \underline{\quad}$ , so  $12 + 13 = \underline{\quad}$   
 f)  $14 + 14 = \underline{\quad}$ , so  $14 + 13 = \underline{\quad}$

**Answers:** a) 14, 15; b) 8, 9; c) 18, 17; d) 12, 13; Bonus: e) 24, 25; f) 28, 27

Write on the board:

$$6 + 7 = \boxed{\phantom{00}} + \boxed{\phantom{00}} + 1$$

Tell students that you want to put the same number in each box. Ask a volunteer what goes in each box. (6, 6) Fill in the boxes. Ask students how writing  $6 + 7$  this way can make it easier to solve. Emphasize that if students know the doubles, they don't have to count on from the 6 or the 7—they just have to say the double and add 1. Emphasize that students are changing the problem into two simpler problems that they already know how to do—doubling and adding 1.

**Deciding which double to solve before using it to add.** In the following exercises, students can use either double to find the answer. If students struggle, encourage them to double the smaller number and then add 1.

**Exercises:** Use a double to add.

- a)  $6 + 5 = \underline{\quad}$       b)  $7 + 6 = \underline{\quad}$

**Bonus**

- c)  $20 + 21 = \underline{\quad}$       d)  $19 + 20 = \underline{\quad}$

**Answers:** a) use either  $6 + 6 = 12$  or  $5 + 5 = 10$ , the answer is 11; b) use either  $7 + 7 = 14$  or  $6 + 6 = 12$ , the answer is 13, Bonus: c) 41, d) 39

**Choosing between using 10 or using doubles.** Explain that students can use different strategies for different questions. Write on the board:

$$8 + 7 = \underline{\quad} \quad 4 + 7 = \underline{\quad}$$

Point to the first sentence and SAY: This is one more than  $7 + 7$  so it would be easy to use doubles to find the answer. ASK: How many more than

7 + 7 is 8 + 7? (1 more) What is the double of 7? (14) What is one more than 14? (15) Write “15” in the blank. Point to the second sentence and SAY: This is three more than 4 + 4 or three less than 7 + 7, but it seems there is an easier way. ASK: Can you find a pair adding to 10 that 4 + 7 is close to? (yes) What is that pair? (3 and 7 or 4 and 6) What is 3 + 7? (10) How many more than 3 + 7 is 4 + 7? (1 more) What is one more than 10? (11) Write “11” in the blank.

**Exercises:** Would you use doubles or a pair adding to 10? Explain.

a)  $7 + 6 = \underline{\quad}$

b)  $7 + 4 = \underline{\quad}$

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

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

**Answers:** a) This is one more than 6 + 6 so using double seems easier; b) It’s easier to find pairs that add to 10; c) 5 + 5 is both a double and a pair adding to 10, so it doesn’t matter which way you look at this one; Bonus: using 10 wouldn’t make sense, so you have to double in this case

**Fluency practice.** You will need the addition cards you made for this lesson. Write on the board:

$$6 + 6 = 12$$

Show students the card for 6 + 7 and have students signal thumbs up when they know the answer. Ask volunteers for the answer (13) and how they know. Repeat for 7 + 6.

Show the card 8 + 9, allow time for students to signal they know the answer, and then have volunteers say how they got the answer. If volunteers did not use a double, ask if anyone did use a double and which double they used. Then ask if anyone used a different double. Repeat with other addition sentences and cards, in random order.

**Word problems using doubles.** Write on the board:

Ben has 4 stickers. Don has double that number. How many stickers does Don have?

Read the question aloud and explain that students can use doubling to find the answer to these types of question. ASK: What is the double of 4? (8) How many stickers does Don have? (8)

**Exercises:** Use a double to find the answer.

a) Jay has 7 stickers. Ken has double that number. How many stickers does Ken have?

b) Liz has 6 stickers. Ron has double that number. Hanna has one more than Ron. How many stickers does Hanna have?

c) Emma is 5 years old. Sara is double the age of Emma. Mary is 1 year younger than Sara. How old is Mary?

**Answers:** a) 14, b) 13, c) 9



## Extensions

1. Draw lines to match two pairs of near doubles in the addition below. Then add.

$$5 + 2 + 6 + 3$$

**Answer:**  $5 + 2 + 6 + 3 = 11 + 5 = 16$

2. Mike is 11 years old. Bob is 1 year more than double Mike's age. How old is Bob?

**Answer:** 23

3. Circle the numbers you would add first. Then find the total.  
Hint: Each question has a pair that adds to 10 or a double.

a)  $5 + 7 + 3$

b)  $6 + 6 + 3$

c)  $8 + 7 + 2$

**Sample answers:** a) add  $7 + 3$  first, 15; b) add  $6 + 6$  first, 15;  
c) add  $8 + 2$  first, 17

# NS1-87 Halves and Quarters

Pages 88–90

## CURRICULUM REQUIREMENT

AB: optional

BC: optional

MB: optional

ON: required

## VOCABULARY

half

less than

more than

part

quarter

whole

## Goals

Students will learn to identify and estimate halves and quarters in shapes.

## PRIOR KNOWLEDGE REQUIRED

Can identify figures that are the same size and shape

Knows the concepts of more and less

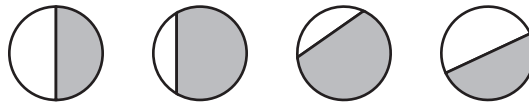
## MATERIALS

paper circles and squares

blank paper

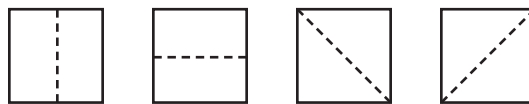
**BLM Half** (p P-55)

**Introduce half.** Draw a circle on the board. Tell students it is a pizza and you want to cut it in half so that you can share it with a friend. Try cutting it different ways, as shown below, and ask students each time if you've cut it in half:



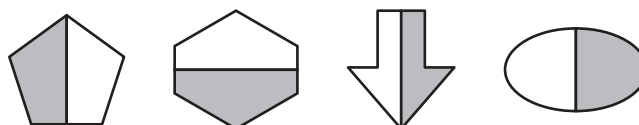
Then explain that for a part of a whole to be one half, it needs to be one of two same-sized parts. Draw several other parts of circles (e.g., a pizza slice) and ask students to say if it is a half or not. Now give each student a paper circle and challenge them to fold it in half. Then tell them to fold it so that one piece is more than half and the other is less than half. **ASK:** Can both parts be more than half? Ask for situations where we want to divide things in half, so that both parts are the same size. **EXAMPLE:** sharing food.

**Half of a square.** Give each student a paper square and challenge them to fold it in half. Challenge them to find another way until as a class they have found at least one of the first two and one of the last two below:



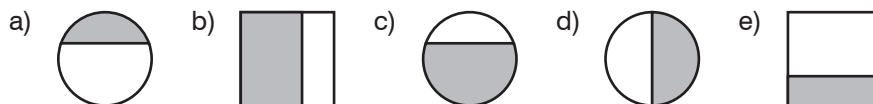
Have volunteers show different solutions. Challenge students to fold their paper so that one part is more than half. **ASK:** Is the other part more than half or less than half? (less than half)

**Half of other shapes.** Show different shapes with halves shaded and for each shape, ask if the shaded part is half. **EXAMPLES:**



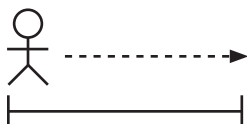
For the following exercises, have students signal thumbs up if the shaded part shows more than half and thumbs down if the shaded part shows less than half.

**Exercises:** Does the shaded part show more than half or less than half?



**Answers:** a) less than half, b) more than half, c) more than half, d) more than half, e) less than half

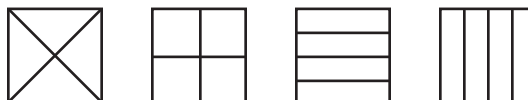
**Half of a length.** Draw on the board the picture below and explain that Patti wants to walk from one end of the line to the other:



Ask students to show where they think Patti will be when she is halfway along the line and ASK: If Patti is there, how far did she already come? (half) How far does she have to go? (half) Are they the same? (yes) How can you tell? (both are half way)

**Checking halves by folding.** Give each student a blank sheet of paper and have them draw a straight line anywhere across the page. Then have them guess where the halfway point is and mark it. To check their estimate, students can draw a big dot at each end of the line and then fold the sheet so that the dots meet. Is the mark they made close to the fold? Have them repeat with other lines on the same sheet, first guessing where the half is and then checking their estimate.

**Introduce quarters.** SAY: When you divide a piece of paper into four equal parts, you have divided the paper into quarters. Challenge students to fold a paper square into quarters in as many different ways as they can. EXAMPLES:



Show them other shapes divided into four parts and ask them if they are quarters or not. Ensure all examples are either obviously same-sized or obviously not the same size (e.g., do not use a rectangle cut in four along its diagonals). Emphasize that for one part to be a quarter, it has to be one of four same-sized parts.

## Extensions

1. Ask students to brainstorm things they might have heard of that are divided into quarters and halves, such as hours, sports games, measuring cups, dollars, notes in music, and sale prices or discounts.

### EXTRA PRACTICE

#### BLM Half

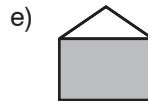
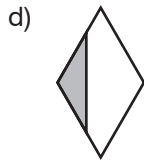
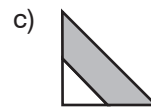
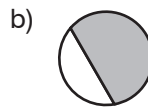
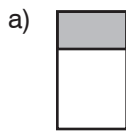
**Answers:** no, yes, yes, no

2. Is this square divided into quarters? How do you know?



**Answer:** yes, because each equal half is divided into 2 equal parts

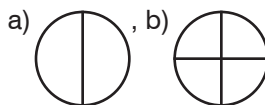
3. **BLM Pencils** (p P-56) guides students to discover that if Sam's pencil is half as long as Tara's and Tara's pencil is half as long as Ben's, then Sam's pencil is a quarter as long as Ben's.
4. **Quarter of a length.** Have students draw lines and guess where a quarter is. Students check their answers as follows: draw a big dot at each end and fold to find half as before, then fold again so that the half-way mark (now the side of the sheet) meets the dark dot. Have students complete **BLM Quarter** (p P-57). (no, yes, no, no).
5. Point to each shape below, and ask students to signal thumbs up if the shaded part shows more than half and thumbs down if the shaded part shows less than half.



**Answers:** a) less than half, b) more than half, c) more than half, d) less than half, e) more than half, f) less than half

6. A family buys 2 pizzas. 1 is a cheese pizza and 1 is a pepperoni pizza.
- a) The cheese pizza is divided in half. Draw the cheese pizza.
- b) The pepperoni pizza is divided into quarters. Draw the pepperoni pizza.
- c) Kathy eats 2 pieces of pepperoni pizza. Tristan eats 1 piece of cheese pizza. Kathy says she ate more pizza because she ate more pieces. Is she correct? Explain.

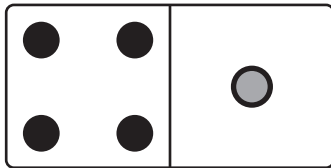
**Answers**



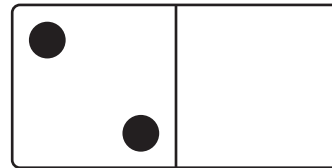
c) No, Kathy is not correct. Two pieces of the pepperoni pizza is the same amount of pizza as one piece of the cheese pizza. Kathy and Tristan ate the same amount.

# Five-Dot Dominoes

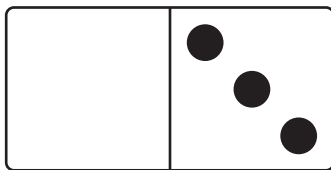
- ☐ Draw the missing dots to make 5.
- ☐ Finish the addition sentence.



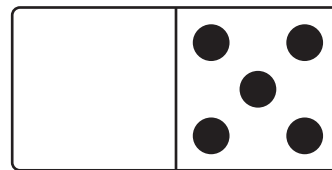
$$4 + \square = 5$$



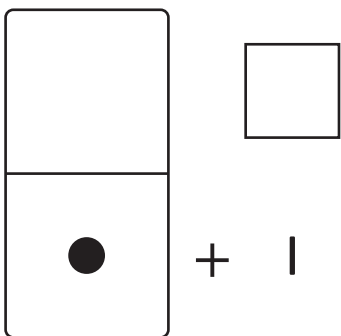
$$5 = 2 + \square$$



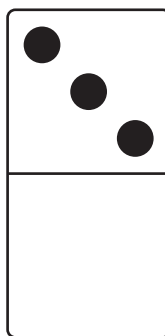
$$\square + 3 = 5$$



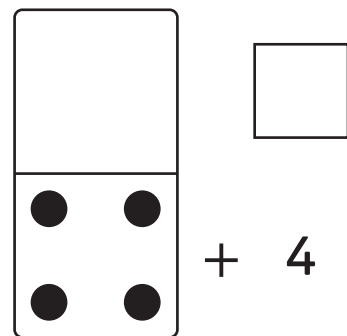
$$5 = \square + 5$$



$$\begin{array}{r} \square \\ + 1 \\ \hline 5 \end{array}$$



$$\begin{array}{r} 3 \\ + \square \\ \hline 5 \end{array}$$



$$\begin{array}{r} \square \\ + 4 \\ \hline 5 \end{array}$$

# Adding Many Numbers

- ☐ Pair up numbers that add to 5.
- ☐ Re-write the addition sentence.
- ☐ Count by 5s to add.

$$\begin{array}{c} \text{1 + 2 + 3 + 4} \\ \text{= 5 + 5 = 10} \end{array}$$

$$\begin{array}{c} 4 + 1 + 3 + 2 \\ = \end{array}$$

$$\begin{array}{c} 1 + 3 + 4 + 2 \\ = \end{array}$$

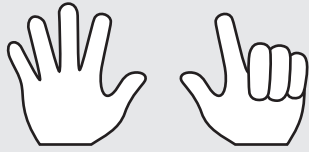
$$\begin{array}{c} 2 + 3 + 4 + 1 \\ = \end{array}$$

$$\begin{array}{c} 1 + 4 + 3 + 2 + 2 + 4 + 3 + 1 \\ = \end{array}$$

$$\begin{array}{c} 2 + 3 + 1 + 2 + 4 + 3 + 3 + 2 \\ = \end{array}$$

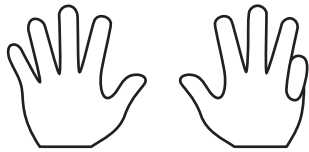
## Pairs Adding to 10

☐ Write the missing numbers.



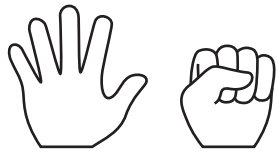
$$\boxed{7} + \boxed{3} = 10$$

fingers up   fingers down   altogether



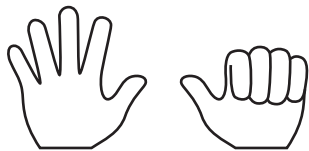
$$\boxed{\phantom{0}} + \boxed{\phantom{0}} = 10$$

fingers up   fingers down   altogether



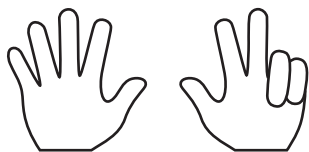
$$\boxed{\phantom{0}} + \boxed{\phantom{0}} = 10$$

fingers up   fingers down   altogether



$$\boxed{\phantom{0}} + \boxed{\phantom{0}} = 10$$

fingers up   fingers down   altogether

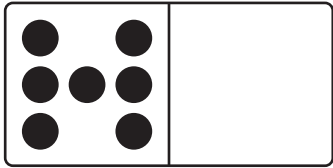


$$\boxed{\phantom{0}} + \boxed{\phantom{0}} = 10$$

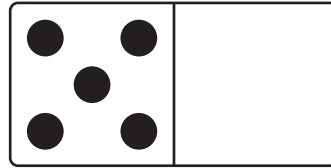
fingers up   fingers down   altogether

# Ten-Dot Dominoes

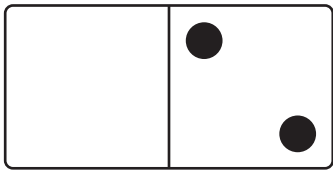
- ☐ Draw the missing dots to make 10.
- ☐ Finish the addition sentence.



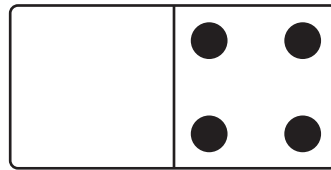
$$7 + \square = 10$$



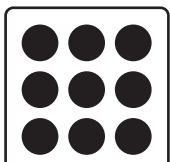
$$10 = 5 + \square$$



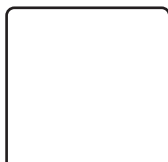
$$\square + 2 = 10$$



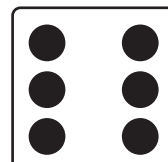
$$10 = \square + 4$$



$$\begin{array}{r} 9 \\ + \square \\ \hline 10 \end{array}$$



$$\begin{array}{r} \square \\ + 6 \\ \hline 10 \end{array}$$



$$\begin{array}{r} 6 \\ + \square \\ \hline 10 \end{array}$$



# Ten Wins

What number do you need to win?



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



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



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



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

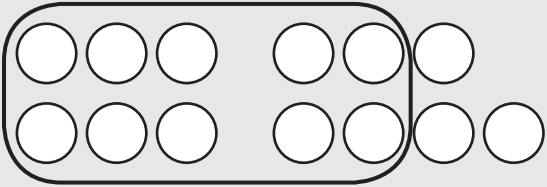


$$4 + \underline{\quad\quad} = 10$$

# Making 10 to Add

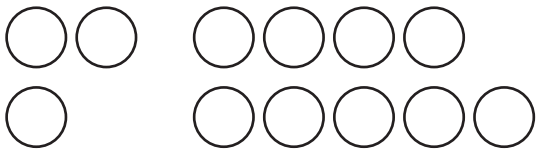
- ☐ Make a group of 10 circles.
- ☐ Fill in the blanks.

6                      7



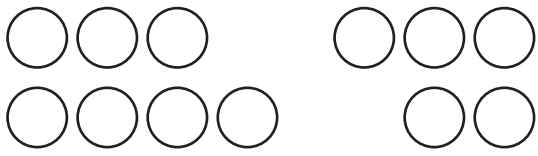
$10 + \underline{3} = \underline{13}$

3                      9



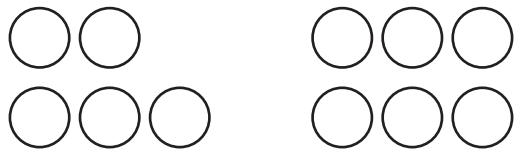
$10 + \underline{\quad} = \underline{\quad}$

7                      5



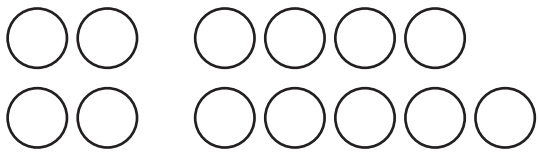
$10 + \underline{\quad} = \underline{\quad}$

5                      6



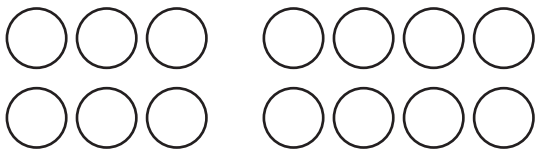
$10 + \underline{\quad} = \underline{\quad}$

4                      9



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

6                      8



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

# Colouring Stars

☐ Colour one star at a time.



coloured		not coloured		total
↓		↓		↓
<div>0</div>	+	<div>10</div>	=	<div>10</div>

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coloured		not coloured		total
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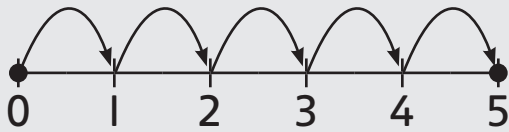
<div></div>	+	<div></div>	=	<div></div>
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<div></div>	+	<div></div>	=	<div></div>
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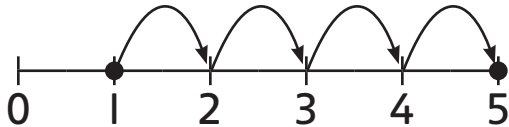
<div></div>	+	<div></div>	=	<div></div>
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Which number stayed the same? Why?

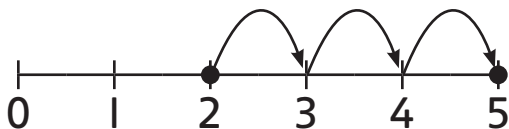
# Patterns in Adding on Number Lines



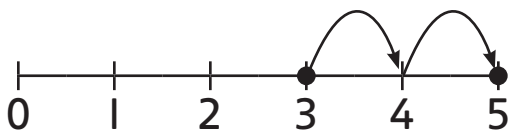
$$\boxed{0} + \boxed{5} = \boxed{5}$$



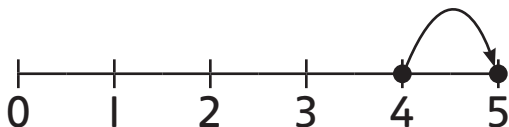
$$\boxed{1} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$



$$\boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$



$$\boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$



$$\boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$



$$\boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

Which number is the same every time?  
 1st number                  2nd number                  total

As the 1st number goes up by 1,  
 the 2nd number \_\_\_\_\_.

# What Is the Double?

☐ Add by counting on.

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

$$\begin{array}{r} 4 \\ + 4 \\ \hline \boxed{\phantom{0}} \end{array}$$

$$\begin{array}{r} 7 \\ + 7 \\ \hline \boxed{\phantom{0}} \end{array}$$

$$\begin{array}{r} 0 \\ + 0 \\ \hline \boxed{\phantom{0}} \end{array}$$

$$\begin{array}{r} 6 \\ + 6 \\ \hline \boxed{\phantom{0}} \end{array}$$

$$\begin{array}{r} 1 \\ + 1 \\ \hline \boxed{\phantom{0}} \end{array}$$

$$\begin{array}{r} 8 \\ + 8 \\ \hline \boxed{\phantom{0}} \end{array}$$

$$\begin{array}{r} 2 \\ + 2 \\ \hline \boxed{\phantom{0}} \end{array}$$

$$\begin{array}{r} 5 \\ + 5 \\ \hline \boxed{\phantom{0}} \end{array}$$

$$\begin{array}{r} 9 \\ + 9 \\ \hline \boxed{\phantom{0}} \end{array}$$

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 \_\_\_\_.

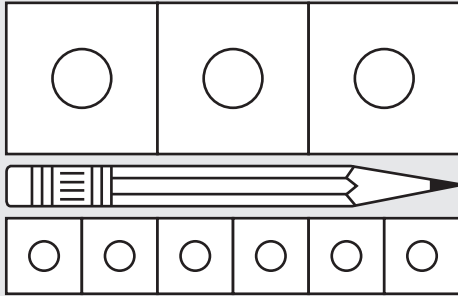
The double of 2 is \_\_\_\_.

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

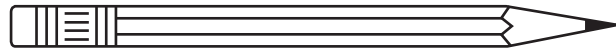
The double of 6 is \_\_\_\_.

# Big Cubes and Small Cubes

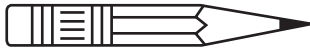
- ☐ Measure two ways.  
Use big  and small .



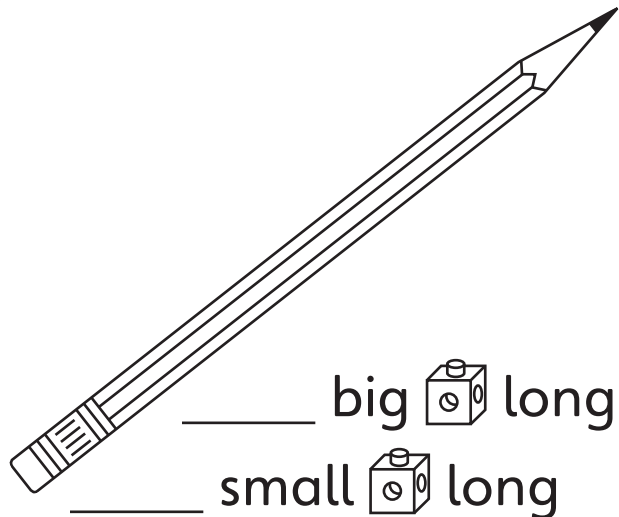
  3   big  long  
  6   small  long





       big  long  
       small  long



       big  long  
       small  long



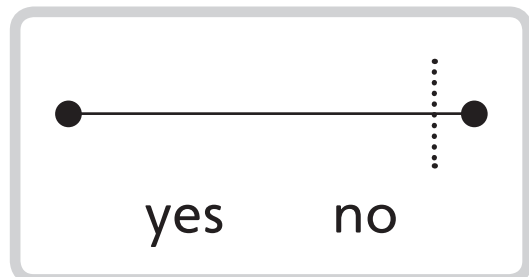
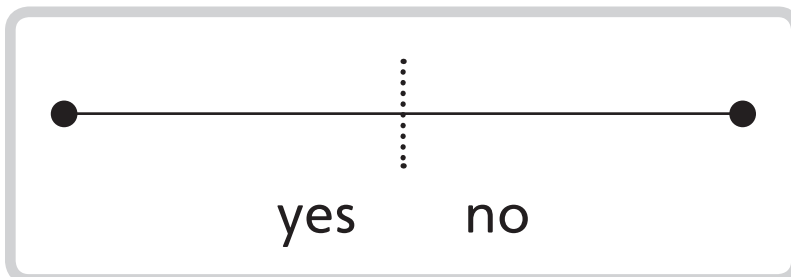
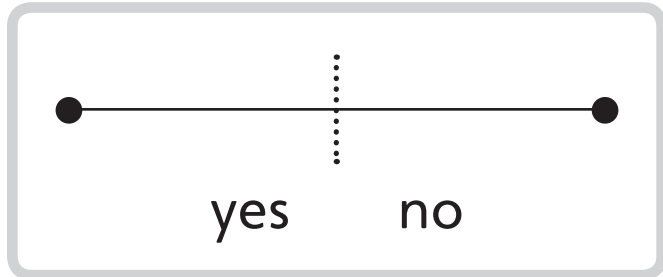
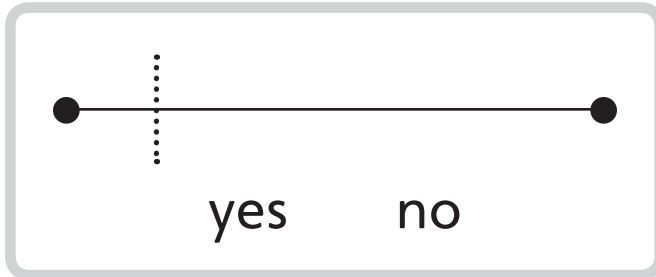
       big  long  
       small  long

The number of small  is always \_\_\_\_\_  
the number of big .

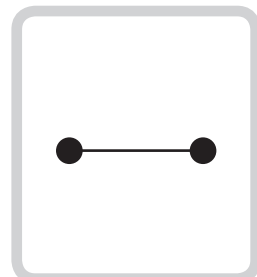
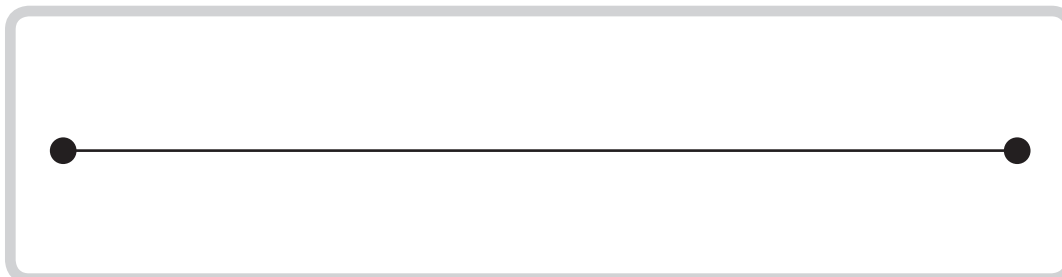
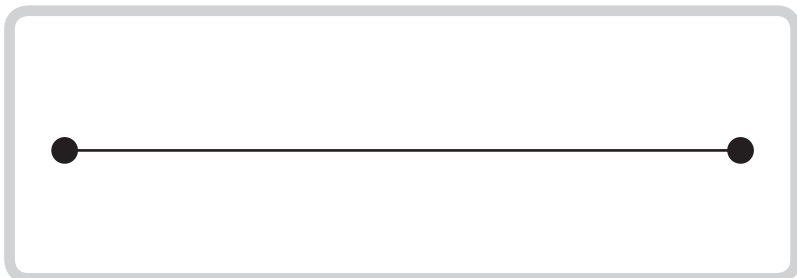
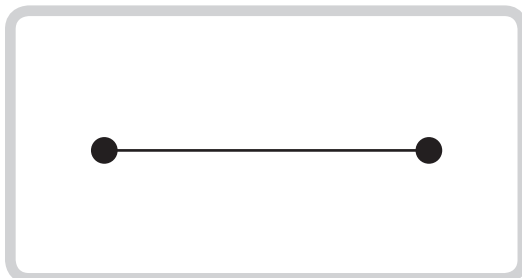
- ☐ A book is 14 big  long. It is \_\_\_\_\_ small  long.

# Half

Does the dotted line show half?



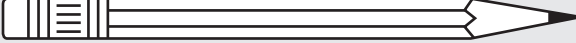
- ☐ Draw a line to show half.
- ☐ Fold to check your answer.



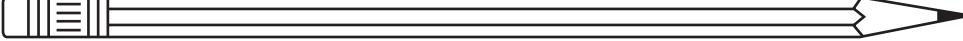
# Pencils

Tara's pencil is half as long as Ben's pencil.

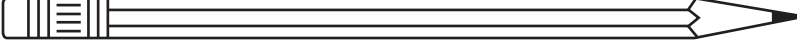
☐ Draw Tara's pencil.

Ben 

Tara 

Ben 


Tara


Ben 

Tara

Sam's pencil is half as long as Tara's pencil.

☐ Draw Sam's pencil.

Ben 

Tara 

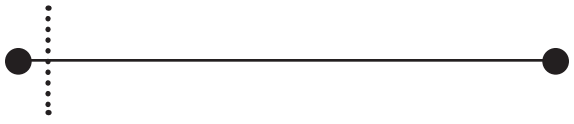
Sam

Sam's pencil is a \_\_\_\_\_ as long as Ben's.

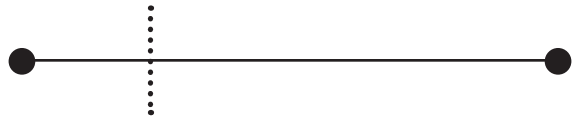


# Quarter

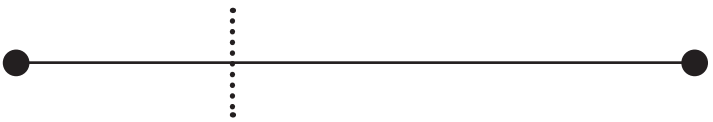
Does the dotted line show a quarter?



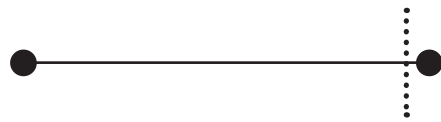
yes      no



yes      no








yes      no



yes      no

☐ Draw a line to show a quarter.

☐ Fold to check your answer.

# Ten-Frames




# Game Cards

<div>I have</div> <div>Who has</div>	<div>I have</div> <div>Who has</div>
<div>I have</div> <div>Who has</div>	<div>I have</div> <div>Who has</div>

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