# Doubles and Near-Doubles 2

## Mathematical Goals

- Explore the addition strategies "doubles" and "near-doubles"
- Use a number line and a tape diagram to reason about addition as adding to
- Use a number line and a tape diagram to reason about subtraction as taking away
- Understand that, in an equation, subtracting 1 from one addend and adding 1 to the other addend does not change the total

## Misconceptions Addressed

**ERROR**
- Is unable to transfer between different representations of the same operation

## Materials Needed

✓ Student pages and markers (two colors per student)
✓ Response boards
✓ Connecting cubes or counters (available for student use every day)
✓ Hole punch (for teacher demonstration)
✓ Show Me Cards AS2-1 through AS2-6

## Focus on Language

Model the use of these words and encourage students to use them throughout the lesson. Consider displaying the words so students can see them as they work. Spanish cognates are in parentheses.

- basic facts
- double *(doble)*
- near-double

## ⤵ show me

Begin the lesson by using Show Me Cards **AS2-1** through **AS2-6**. During today's show me, students will complete equations involving the addition and subtraction of numbers that add to 10. Have students answer the following questions on their response boards.

- Write an equation and show me your answer.
    - **AS2-1**    What number equals 7 plus 3?

      ***Answer:*** $\underline{10} = 7 + 3$

    - **AS2-2**    One equals what number minus 9?

      ***Answer:*** $1 = \underline{10} - 9$

    - **AS2-3**    Six plus 4 equals what number?

      ***Answer:*** $6 + 4 = \underline{10}$

    - **AS2-4**    Ten equals 10 plus what number?

      ***Answer:*** $10 = 10 + \underline{0}$

    - **AS2-5**    Anna had 10 photos to put in her album. She put 8 on one page. How many more does she have to put on the next page?

      ***Answer:*** $10 - 8 = \underline{2}$

    - **AS2-6**    Mr. Gomez had some coins in a jar. He put 5 more coins in the jar. Now he has 10 coins in the jar. How many coins were in the jar to start?

      ***Answer:*** $\underline{5} + 5 = 10$

To finish, have students complete the show me problem.

**Doubles and Near-Doubles** **2**

⤵ show me

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

Student page 7

## ⟳ setting the direction ·································································

**Explore Doubling**

Fold a piece of paper in half and make one hole through both sides of the folded sheet with a hole punch.

- ● How many holes do you think there will be when I unfold the paper?

  *Answer:* 2

- ● Why do you think so?

Unfold the paper so that students can check their responses.

- ● How can we record what happened on the board?

  *Answer:* 1 + 1 = 2, double 1 is 2

Write on the board "1 + 1 = 2, double 1 is 2."

Now refold the paper and make another hole with the hole punch.

- ● How many holes do you think there will be now when I unfold the paper?

  *Answer:* 4

Unfold the paper so that students can check their responses.

Write on the board "2 + 2 = 4, double 2 is 4."

Continue the activity by making a third hole on the folded piece of paper, and then have students predict the number of holes when the paper is unfolded. Again write the equation and doubles fact on the board.

Repeat for four holes and five holes on the folded paper. Record each time.

The doubles facts are:

- • 1 + 1 = 2, double 1 is 2
- • 2 + 2 = 4, double 2 is 4
- • 3 + 3 = 6, double 3 is 6
- • 4 + 4 = 8, double 4 is 8
- • 5 + 5 = 10, double 5 is 10

Continue the doubles pattern until you reach 10 + 10 = 20.

## ⮑ work time

**Presenting the Task**

Read problem 1 to students.

● How does the example number line show the double?

*Answer:* It starts on the number 0 and then shows 2 jumps of 3 intervals.
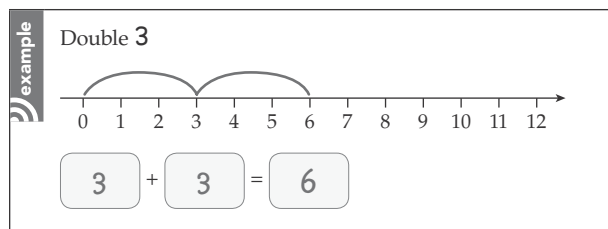
**scaffolding for success**

If students are having difficulty, break each task down into steps and model the process for them.
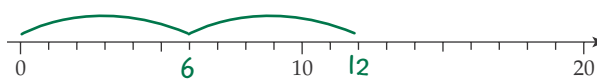
Have students move in and out of solo work and partner work as needed to complete problem 1.

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1. Show the double on the number line using jumps.
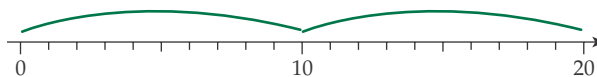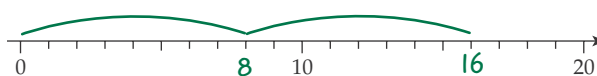
   Write the double as an equation.

   **example**

   Double **3**

   $$ \boxed{3} + \boxed{3} = \boxed{6} $$

   a. Double **6**

   $$ \boxed{6} + \boxed{6} = \boxed{12} $$

   b. Double **10**

   $$ \boxed{10} + \boxed{10} = \boxed{20} $$

   c. Double **8**

   $$ \boxed{8} + \boxed{8} = \boxed{16} $$

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## ⮑ probing for understanding

Have students share the methods they used to find solutions. Ask:

● Can you show us what you did on the number line and tell us how it helped you find the double?

● Where do you see the starting number on your number line?

● How does the number line show that you doubled the number (as opposed to simply adding any number to the starting number.) Where do you see the total on your number line?

**Exploring Near-Doubles**

Now introduce the idea of using near-doubles. Write "5 + 6" on the board.

● How can we use what we know about doubles to find the total?

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ADDITION AND SUBTRACTION

● **What is double 5?**
*Answer:* 10

● **How many more do we need to add on?**
*Answer:* 1

● **Why?**
*Answer:* Because 6 is 1 more than 5

Write on the board "5 + 5 + 1 = 11, double 5 add 1 more is 11."

● **If we use the double 6 number fact, what would we need to do to find the total?**
*Answer:* We need to subtract 1 because 5 is 1 less than 6.

Write on the board "6 + 6 – 1 = 11, double 6 minus 1 is 11."

## work time

**Presenting the Task**

Read problem 2 to students. Ask someone to say how the picture matches the problem.

Allow students to work solo on the problem for about 1 minute.

Then have students work with their partners using the partner work ritual. Remind them to be good listeners and ask questions when they are not clear about their partners' explanations.

> **2.** Use doubles to help you solve this problem.
>
> Tamika had **6** quarters.
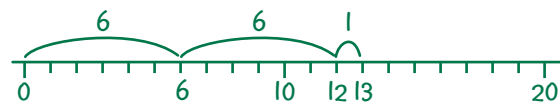> Her uncle gave her **7** more quarters.
> How many quarters does she have now?
>
> ◎ Make a math drawing.
> ◎ Write an equation.
> ◎ Write your answer as a sentence.
>
> Possible answers:
>
>
> 6 + 6 = 12
> 6 + 7 = 13
> Tamika has 13 quarters.

*Student page 9*

### teaching strategies

This is the easiest type of addition situation—adding to. If students have difficulty knowing which operation to use, consider having them act it out.

In problems 2 and 3, students will need to decide whether to add or subtract when solving word problems, and they will be asked to defend their decisions.
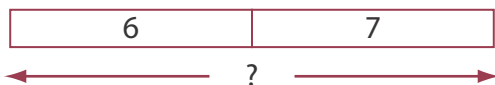
## ⟳ probing for understanding

Initiate a discussion using the following questions:

● What operation did you use to solve this problem? How did you know that this was an addition situation?

● A tape diagram for this problem would look like this:

Sketch a tape diagram on the board.

| 6 | 7 |
|---|---|

← ? →

● Since we know both of the values in the boxes, we need to add to find the total.

● Why might you use doubles to help you solve this problem (if the Student Book did not tell you to do so)?

● How did you use doubles to help you solve the problem?

Students have been prompted to include an equation, a math drawing or diagram (if appropriate), and the answer in a complete sentence every time they respond to a word problem. We call these arithmetic problems (involving only numbers to 10) *basic facts*. They are the building blocks of all harder computations, and the goal is to know them so well that when we see them, we just automatically know the answers. Also, if the problem includes a picture or a diagram that is detailed enough to use as a model for the arithmetic, then it does not make sense to draw another diagram or sketch.

If you see any students who have omitted the equation or the complete sentence, ask them to include it now.

## ⤷ work time

### Presenting the Task

Read problem 3 to students. Point out that this time they are prompted for a "complete solution." Remind students to check the list at the back of the book if they forget what they need to include.

Allow students to work solo on the problem for about 1 minute. Then have students compare their solutions with their partners.

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**3.** Use doubles to help you solve this problem.

Tran had **15** comic books.
He gave **8** to Malaya.
How many does he have left?

◎ Write an equation.
◎ Draw a diagram.
◎ Write your answer as a sentence.

**Possible answers:**

8          8     1

0              8  10        15 16      20

8 + 8 = 16

8 + 7 = 15

Tran has 7 comic books left.

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## ⤷ probing for understanding

Initiate a discussion using the following question:

● Why do you think that this problem is a subtraction situation?

Again, a tape diagram can help students make sense of this situation:

| 8 | ? |
|---|---|

← 15 →

Remember, in a "take away" situation, it is easiest to interpret the tape diagram as "part/whole." In this case, "Tran had a total of 15 comic books. He gave part of his collection (8) to Malaya. How many are in the part that he has left?"

● Could we have used any other operation to solve the problem?

*Answer:* This is the easiest type of subtraction situation—"take away" where the difference is unknown. Students might suggest counting back, but hopefully they will associate that with subtraction.

● How does your diagram match the problem?
● Where do you see the 15 comic books in your diagram?
● Where do you see the 8 comic books that Tran gave to Maria in your diagram?
● Where do you see the answer in your diagram?

Ask students to look at their student pages to see if they have included all of the parts of a complete solution. If they have omitted the equation, the math drawing or diagram, or the complete sentence, ask them to add it now.

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ADDITION AND SUBTRACTION     **17**

⮑ **reflection** ....................................................................

**Writing the Reflection**

Have students respond to the reflection prompt.

Finally, have students fill in the shaded squares in the addition table.

⮑ reflection ....................................................

Some doubles that I know are …

Fill in the sums in the shaded squares.

| + | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 0 | 1 | 2 | | | | | 7 | 8 | 9 | 10 |
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 2 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 3 | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | | 13 |
| 4 | | 5 | 6 | 7 | 8 | 9 | 10 | | | | 14 |
| 5 | | 6 | 7 | 8 | 9 | 10 | 11 | | | | 15 |
| 6 | | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | 16 |
| 7 | 7 | 8 | 9 | 10 | | | 13 | 14 | 15 | | 17 |
| 8 | 8 | 9 | 10 | | | | | 15 | 16 | 17 | 18 |
| 9 | 9 | 10 | 11 | | | | | 16 | 17 | 18 | 19 |
| 10 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

**Student pages 10–11**

# **Doubles and Near-Doubles**

**2**
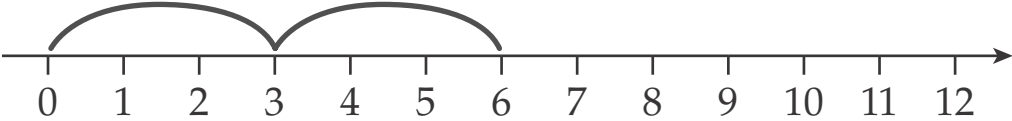
$$10 - \boxed{\phantom{00}} = 3$$

⟳ **work time**

**1.** Show the double on the number line using jumps.

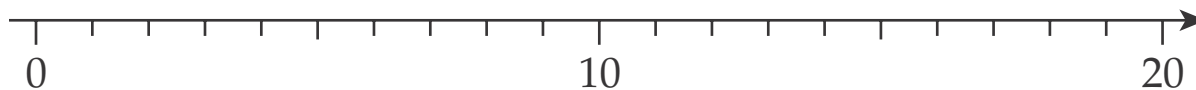Write the double as an equation.

example

Double **3**
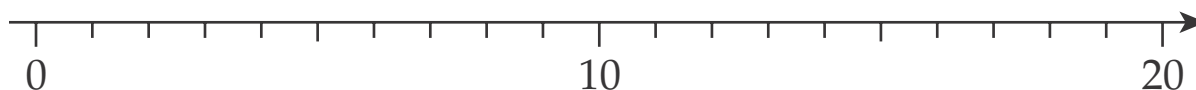


$$\boxed{3} + \boxed{3} = \boxed{6}$$

a. Double **6**

```
0                    10                   20
```
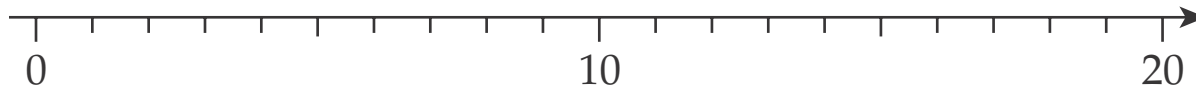
$$\boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

b. Double **10**

```
0                    10                   20
```

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

c. Double **8**

```
0                    10                   20
```

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

**2.** Use doubles to help you solve this problem.

Tamika had **6** quarters.
Her uncle gave her **7** more quarters.
How many quarters does she have now?

◎ Make a math drawing.

◎ Write an equation.

◎ Write your answer as a sentence.

**3.** Use doubles to help you solve this problem.

Tran had **15** comic books.
He gave **8** to Malaya.
How many does he have left?

◎ Write an equation.

◎ Draw a diagram.

◎ Write your answer as a sentence.

↪ **reflection**

Some doubles that I know are …

_____

_____

_____

_____

Fill in the sums in the shaded squares.

| + | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|----|
| 0 | | 1 | 2 | | | | | 7 | 8 | 9 | 10 |
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 2 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 3 | | 4 | 5 | | 7 | 8 | 9 | 10 | | | 13 |
| 4 | | 5 | 6 | 7 | 8 | 9 | 10 | | | | 14 |
| 5 | | 6 | 7 | 8 | 9 | 10 | | | | | 15 |
| 6 | | 7 | 8 | 9 | 10 | | | | | | 16 |
| 7 | 7 | 8 | 9 | 10 | | | | | | | 17 |
| 8 | 8 | 9 | 10 | | | | | | | | 18 |
| 9 | 9 | 10 | 11 | | | | | | | | 19 |
| 10 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

ADDITION AND SUBTRACTION

Fold
Here

What number equals
7 plus 3? Write an
equation and show
me your answer.

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

**Instructional Strategies**

- Count on from 7.
- Count out a group of 7 and a group of 3. Combine the groups and then count all.

**Correct Answer**

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

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

Fold
Here

One equals what number minus 9? Write an equation and show me your answer.

$$1 = \square - 9$$

**Correct Answer**

$$1 = \overline{10} - 9$$

**Instructional Strategies**

- Count on 9 more from 1.
- Restate the problem with a context. For example: "Tran had some action figures in a box. He put 9 of his action figures on a shelf. There is 1 action figure left in the box. How many were in the box to start?" Then act out the story.
- Use a tape diagram.

$$1 = \square - 9$$

Fold
Here

Six plus 4 equals what number? Write an equation and show me your answer.

6 + 4

**Correct Answer**

$6 + 4 = \overline{10}$

**Instructional Strategies**

- Count on—think 6 and count 7, 8, 9, 10—using a 100s chart, a number line, objects, or fingers.
- Count out a group of 6 and a group of 4. Combine the groups and then count all.

6 + 4

Fold
Here

## Correct Answer

$$10 = 10 + \overline{0}$$

## Instructional Strategies

- Reverse the order—10 plus what number equals 10?
- Count out a group of 10 objects and ask how many more are needed to make 10.
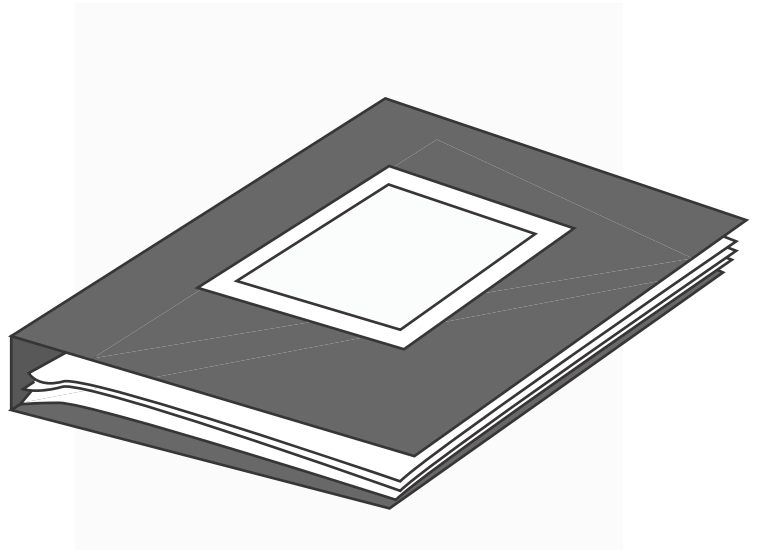- Subtract: $10 - 10$

Ten equals 10 plus
what number? Write
an equation and show
me your answer.

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

$$10 = 10 + \underline{\phantom{000}}$$

Anna had 10 photos to put in her album. She put 8 on one page. How many more does she have to put on the next page? Write an equation and show me your answer.
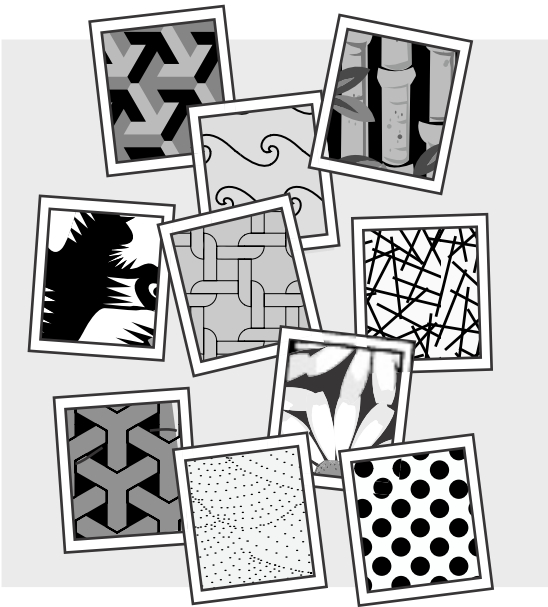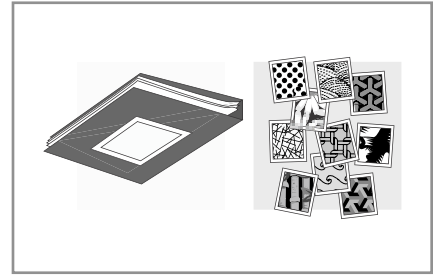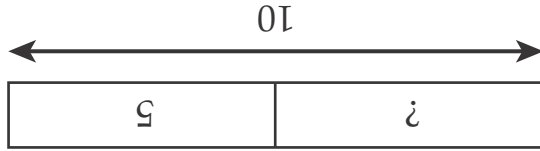


**Correct Answer**

$$10 - 8 = 2$$

**Instructional Strategies**

- Count back from 10 using a 100s chart, a number line, objects, or fingers.
- Lay out a group of 10 objects. Put 8 to one side and count how many are left.
- Use a tape diagram:

| 8 | ? |
|---|---|

10

Fold
Here

Mr. Gomez had some coins in a jar. He put 5 more coins in the jar. Now he has 10 coins in the jar. How many coins were in the jar to start? Write an equation and show me your answer.



**Correct Answer**

$10 = \overline{5} + 5$

**Instructional Strategies**

- Act out the story with coins.
- Count on from 5 to 10. Keep track of how many it takes to get to 10.
- Use a tape diagram:

| ? | 5 |
|---|---|

10