

Objectives

- Demonstrate an understanding of addition properties
- Write addition/subtraction fact families
- Apply the Associative Property of Addition to make 10
- Complete a missing addend equation with a variable
- Explore the use of variables when adding doubles
- Complete a function table

Teacher Materials

- Place Value Kit: ones (to use as counters)
- Doubles Facts & Function Tables transparency, page IA10 (CD)
- Multiplication flashcards: 0 as a factor, 1 as a factor (A list of facts is provided on Appendix pages A14–A16.)

Student Materials

- Place Value Kit: ones (to use as counters)
- Number Cards: 0–9
- Doubles Facts & Function Tables, page IA10 (CD)

Note

Preview the ReTeaching pages 6–11 and the Enrichment pages 7–21 located on the Teacher’s Toolkit CD.

Practice and Review**Multiplication facts: 0 or 1 as a factor**

1. Display the multiplication flashcards slowly, one at a time. Allow volunteers to give the answers.
 - **What strategy can you use to help you remember the facts that have 0 as a factor? *Zero Property of Multiplication***
 - **1 as a factor? *Identity Property of Multiplication***
2. Distribute the Number Cards. Display each flashcard. Direct each student to use Number Cards 0–9 to “write” the product.

Introduce the Lesson

Direct attention to the picture on Worktext page 34. Read aloud the theme story on page 31 of the Chapter 2 Overview.

Teach for Understanding**Demonstrate an understanding of addition properties**

1. Write $7 + 4 = \underline{\quad}$ and $4 + 7 = \underline{\quad}$ for display. Distribute the ones from the Place Value Kits. Tell the students to use the ones as counters and to show $7 + 4$ on their desks.
 - **How did you show $7 + 4$? *a set of 7 and then added a set of 4***
 - **What does $7 + 4$ equal? *11*** Complete the equation.
2. Repeat the procedure for $4 + 7$.
 - **What do you notice about the addends in these equations? *The order of the addends is different.***
 - **What was different in the way you pictured the equations? *Elicit that the order of the sets changed.***
 - **Did the order of the addends change the sum? *no***
 - **What property proves or tells us this? *Elicit the Commutative Property of Addition.***
 - **What does the Commutative Property of Addition tell us? *Changing the order of the addends does not change the sum.***
 - **What is the opposite operation of addition? *subtraction***

3. Explain that subtraction is the *inverse operation* of addition; it is the opposite of addition.
 - **What equation can you write if you take 4 counters away from 11? *$11 - 4 = 7$*** Write $11 - 4 = 7$ beside $7 + 4 = 11$.
 - **What related subtraction equation uses these same numbers? *$11 - 7 = 4$*** Write $11 - 7 = 4$ beside $4 + 7 = 11$.
 - **What do we call these four related equations? *a fact family***
 - **Why do you think they are called a fact family? *Each of the equations contains the same numbers.***
4. Write 4-4-8 for display.
 - **What facts can you write for this fact family? *$4 + 4 = 8$ and $8 - 4 = 4$*** Write both equations for display.
 - **What is different about this fact family? *There are only 2 facts—1 addition and 1 subtraction.***
 - **Why do you think there are only 2 facts in the 4-4-8 fact family? *Elicit that the addends are the same number; if you switch their order, you would have the same addition fact.***
5. Write 7-0-7 for display. Write the fact family equations for display as students give them.
 - **What addition facts can you write for this fact family? *$7 + 0 = 7$ and $0 + 7 = 7$*** Write both equations for display.
 - **What do you know about the sum of an addition equation if one of the addends is 0? *It is the same as the other addend.***
 - **What property proves or tells us this? *Identity Property of Addition or Zero Principle of Addition***
 - **What does the Identity Property of Addition tell us? *When zero is added to an addend, the answer is that addend.***
 - **What subtraction facts can you write for this fact family? *$7 - 0 = 7$ and $7 - 7 = 0$*** Write both equations.
 - **Which of these 2 subtraction equations shows the Zero Property of Subtraction? *$7 - 0 = 7$***
6. Follow a similar procedure for the fact families 6-7-13, 4-8-12, 7-7-14, and 9-6-15.

Apply the Associative Property of Addition to make 10

1. Write $3 + 6 + 4 = \underline{\quad}$ for display. Direct the students to solve the equation mentally. *13*
 - **Which numbers did you add first? *$3 + 6$ or $6 + 4$*** Write for display $(3 + 6) + 4 = 13$ and $3 + (6 + 4) = 13$. Explain that the parentheses tell you to add the numbers within the parentheses first.
 - **Does the sum change when you group the addends differently? *no***
 - **What property states that you can group addends differently without changing the sum? *Associative Property of Addition or Grouping Principle of Addition*** Write *Associative Property of Addition* for display.
 - **Which equation makes it easier to add these 3 addends? *Why? Elicit $3 + (6 + 4)$; you are making 10, and it is easier to add $3 + 10$ than $9 + 4$.*** Write $9 + 4 = 13$ below $(3 + 6) + 4 = 13$; write $3 + 10 = 13$ below $3 + (6 + 4) = 13$.
2. Write $3 + 5 + 7 = \underline{\quad}$ vertically for display.
 - **What would you add first to solve this problem? *Why? Elicit that it is easier to first add $3 + 7$ to make 10.*** Draw a bracket to the right of the 3 and the 7. Write 10 beside the bracket.
 - **What is $5 + 10$? *15*** Write 15 below the line.
3. Repeat the procedure for $4 + 6 + 7 = \underline{\quad}$, 17 , $5 + 8 + 5 = \underline{\quad}$, 18 , and $2 + 9 + 8 = \underline{\quad}$, 19 .

$$\begin{array}{r} 3 \\ 5 \\ + 7 \\ \hline \end{array} \Bigg] 10$$

Addition Properties

Name _____

Chapter

2

Solve. Use the Commutative Property to write the related addition fact.

$$\begin{array}{r} 1. \quad 5 \\ + 7 \\ \hline 12 \end{array} \quad \begin{array}{r} 7 \\ + 5 \\ \hline 12 \end{array} \quad 2. \quad \begin{array}{r} 6 \\ + 8 \\ \hline 14 \end{array} \quad \begin{array}{r} 8 \\ + 6 \\ \hline 14 \end{array} \quad 3. \quad \begin{array}{r} 7 \\ + 9 \\ \hline 16 \end{array} \quad \begin{array}{r} 9 \\ + 7 \\ \hline 16 \end{array}$$

Add parentheses to show grouping 10. Solve.

$$4. (4 + 6) + 8 = 18 \quad 5. 4 + (3 + 7) = 14$$

$$6. 6 + (5 + 5) = 16 \quad 7. (2 + 8) + 3 = 13$$

Use the Associative Property to find the sum.

$$8. \quad \begin{array}{r} 6 \\ + 4 \\ \hline 15 \end{array} \quad 9. \quad \begin{array}{r} 5 \\ + 4 \\ \hline 13 \end{array} \quad 10. \quad \begin{array}{r} 7 \\ + 3 \\ \hline 15 \end{array} \quad 11. \quad \begin{array}{r} 5 \\ + 4 \\ \hline 17 \end{array}$$

Write the missing number that completes the fact family. Write the fact family equations. **Order of equations may vary.**

12. $\underline{0} \quad 9 \quad 9$

$$\begin{array}{r} 0 + 9 = 9 \\ 9 + 0 = 9 \\ 9 - 0 = 9 \\ 9 - 9 = 0 \end{array}$$



13. $\underline{6} \quad 7 \quad 13$

$$\begin{array}{r} 6 + 7 = 13 \\ 13 - 7 = 6 \\ 7 + 6 = 13 \\ 13 - 6 = 7 \end{array}$$



Write the related subtraction fact. Write the value for n .

14. $9 + n = 17$

$$\underline{17} - \underline{9} = \underline{8}$$

$$n = \underline{8}$$

15. $n + 5 = 12$

$$\underline{12} - \underline{5} = \underline{7}$$

$$n = \underline{7}$$

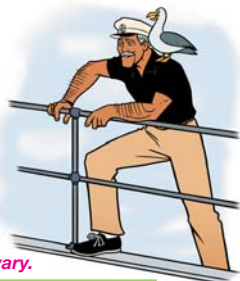
Write the rule. Complete the table.

16. Rule: $m + \underline{4} = n$

m	n
5	9
18	22
29	33
37	41
76	80

17. $37 + n = 41$

18. $76 + n = 80$



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Math 4 Worktext, Chapter 2, Lesson 14

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Solve. Use the Commutative Property to write the related addition fact.

$$1. \quad \begin{array}{r} 7 \\ + 6 \\ \hline 13 \end{array} \quad \begin{array}{r} 6 \\ + 7 \\ \hline 13 \end{array} \quad 2. \quad \begin{array}{r} 9 \\ + 6 \\ \hline 15 \end{array} \quad \begin{array}{r} 6 \\ + 9 \\ \hline 15 \end{array} \quad 3. \quad \begin{array}{r} 0 \\ + 8 \\ \hline 8 \end{array} \quad \begin{array}{r} 8 \\ + 0 \\ \hline 8 \end{array} \quad 4. \quad \begin{array}{r} 8 \\ + 9 \\ \hline 17 \end{array} \quad \begin{array}{r} 9 \\ + 8 \\ \hline 17 \end{array}$$

Use the Associative Property to find the sum. Add parentheses to show grouping 10. Solve.

$$5. 7 + (5 + 5) = 17 \quad 8. \quad \begin{array}{r} 5 \\ 7 \\ + 3 \\ \hline 15 \end{array}$$

$$9. \quad \begin{array}{r} 6 \\ 3 \\ + 4 \\ \hline 13 \end{array} \quad 10. \quad \begin{array}{r} 2 \\ 4 \\ + 8 \\ \hline 14 \end{array}$$

Draw a line through the fact that does not belong.

11. $7 + 8 = 15$ $15 - 7 = 8$ 12. $5 + 7 = 12$ ~~$12 - 4 = 8$~~

~~$8 + 6 = 14$~~ $15 - 8 = 7$ $7 + 5 = 12$ $12 - 7 = 5$

Write the related subtraction fact. Write the value for n .

13. $8 + n = 16$

$$\underline{16} - \underline{8} = \underline{8}$$

$$n = \underline{8}$$

14. $n + 7 = 16$

$$\underline{16} - \underline{7} = \underline{9}$$

$$n = \underline{9}$$

Write the rule. Complete the table.

15. Rule: $m - \underline{7} = n$

m	n
9	2
27	20
58	51
70	63
81	74
95	88

Solve and label.

19. Samantha collected shells along the beach. She found 9 shells on Monday and 5 shells on Tuesday. How many shells did she find in all?

$$9 + 5 = 14 \text{ shells}$$

20. Adam found 9 clam shells, 2 conch shells, and 7 oyster shells. How many shells did he find altogether?

$$9 + 2 + 7 = 18 \text{ shells}$$

Complete **Daily Review** on page 57.

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Math 4 Worktext, Chapter 2, Lesson 14

Complete a missing addend equation

- Write $7 + \underline{\quad} = 13$ for display.
 - What do you notice about this missing addend equation? *Elicit that you know the sum, but only one of the addends is known.*
 - What does the answer line represent? *the missing addend*
- Erase the answer line and write n in its place. Explain that you can also write a missing addend equation by substituting a letter or a *variable* such as n for the missing addend.
 - What do you think the n represents? *the missing addend or number or the answer line*
 - How would you solve a missing addend equation? *Answers will vary, but elicit that you can solve a missing addend equation by solving a related subtraction equation.*
 - What related subtraction equation can you write to find the missing addend, or what n equals? $13 - 7 = 6$
- Write $13 - 7 = 6$ below $7 + n = 13$.
 - What is the missing addend? **6**
- Write $n = 6$ below $13 - 7 = 6$. Write $7 + 6 = 13$ beside $7 + n = 13$. Lead in reading the completed equation.
- Follow a similar procedure for $\underline{\quad} + 9 = 17$. **8**

Explore the use of variables when adding doubles

- Distribute the Doubles Facts & Function Tables worksheets and direct attention to the first equation on the Doubles Facts & Function Tables transparency.
 - What does n equal? How do you know? $4; 4 + 4 = 8$
 Write 4 to complete $n = \underline{\quad}$. Direct the students to do the same. Guide them in completing the equation: $4 + 4 = 8$.

- Explain that any letter can be used as a variable, but that in a given equation each letter can represent only one value. Point out that in the equation $n + n = 8$, each n equals 4.
- Guide the students in determining the value of the variables in equations 2–6: $y = 9, b = 5, a = 6, c = 8, z = 7$.

Complete a function table

- Direct attention to the columns of numbers in Table 1 on the transparency. Tell each student to start with the numbers on the left and think of what he must do to end up with the answers on the right.
 - What is the rule for this table? **add 3**
- Remind the students that the variables a and b can be substituted for the numbers in those columns.
 - Using a and b , what equation can you write as the rule for this table? $a + 3 = b$
 Write the rule above the table and direct the students to do the same. Instruct them to complete the table. **9**
- Repeat the procedure for the remaining tables. $m + 2 = n, 9; y + 5 = z, 11; c - 4 = d, 5$



Worktext pages 35–36, 57 (a)

Extended Activities

The activities that correlate with Chapter 2 are located on the Teacher's Toolkit CD.