

## • Addition Word Problems with Missing Addends

### Power Up

#### facts

Power Up A

#### count aloud

Count by twos from 2 to 50 and then back down to 2.

#### mental math

**Number Sense:** Add a number ending in 0 or 9 to another number.

$$\begin{array}{r} \text{a.} \quad 28 \\ + 30 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b.} \quad 28 \\ + 29 \\ \hline \end{array}$$

$$\begin{array}{r} \text{c.} \quad 37 \\ + 50 \\ \hline \end{array}$$

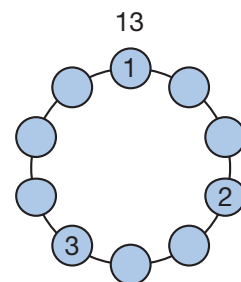
$$\begin{array}{r} \text{d.} \quad 37 \\ + 49 \\ \hline \end{array}$$

$$\begin{array}{r} \text{e.} \quad 56 \\ + 40 \\ \hline \end{array}$$

$$\begin{array}{r} \text{f.} \quad 56 \\ + 39 \\ \hline \end{array}$$

#### problem solving

Choose an appropriate problem-solving strategy to solve this problem. Copy this design of ten circles on your paper, following the same pattern as described in Lesson 8. Then, outside each circle, write the sum of the numbers in that circle and the two circles on either side. For example, the number outside of circle 1 should be 13.



### New Concept

In the “some and some more” problems we have solved so far, both the “some” number and the “some more” number were given in the problem. We added the numbers to find the total.

In this lesson we will practice solving word problems in which the total is given and an addend is missing. We can solve these problems just like arithmetic problems that have a missing addend—we subtract to find the missing number.

### Example 1

**Walter had 8 marbles. Then Lamont gave him some more marbles. Walter has 17 marbles now. How many marbles did Lamont give him?**

**If we can recognize the plot, we can write a number sentence to solve the problem.** Walter had some marbles. Then he received some more marbles. This problem has a “some and some more” plot so it can be represented with an addition formula. We know the “some” number. We know the total number. We put these numbers into the formula.

**Formula:** Some + Some more = Total

**Problem:** 8 marbles +  $m$  marbles = 17 marbles

We see that one of the addends is missing. One way to find the missing number is to ask an addition question.

“Eight plus what number equals seventeen?”

$$8 + m = 17$$

Since  $8 + 9 = 17$ , we know that Lamont gave Walter **9 marbles**.

One way to check the answer is to see if it correctly completes the problem.

*Walter had 8 marbles. Then Lamont gave him 9 marbles.  
Walter now has 17 marbles.*

#### Math Symbols

We can use  $M$  or  $m$  to represent the missing addend.

### Example 2

**Jamie picked some apples. Then she picked 5 more apples. Now Jamie has 12 apples. How many apples did Jamie pick at first?**

This is a “some and some more” word problem. We fill in the formula.

Some	$n$ apples
+ Some more	+ 5 apples
<hr/> Total	<hr/> 12 apples

We can find the missing number by asking an addition question or by asking a subtraction question.

“Five added to what number equals twelve?”

“Twelve minus five equals what number?”

Seven is the answer to both questions. First Jamie picked **7 apples**.

Some addition problems are about parts adding up to a whole.

**Formula:** Some + Some more = Total

**Formula:** Part + Part = Whole

The problem in Example 3 is about a whole class divided into two parts.

### Example 3

#### Reading Math

We translate the problem using an addition formula.

One part: 14 boys  
Other part: girls  
Whole class:  
24 students

**There are 24 students in the whole class. If there are 14 boys in the class, how many girls are there?**

One part of the class is boys and the other part is girls.

**Formula:** Part + Part = Whole

**Problem:** 14 boys + girls = 24 students

We can write the number sentence  $14 + g = 24$ .

Since  $14 + 10 = 24$ , we know that there are **10 girls** in the class.

 **Justify** Is the answer reasonable? How do you know?

### Lesson Practice

**Formulate** Write and solve equations for problems **a–c**.

- Lucille had 4 marigolds. Lola gave her some more marigolds. Now Lucille has 12 marigolds. How many marigolds did Lola give Lucille?
- Twelve of the 25 students in the class were girls. How many boys were in the class?
- At 7:00 a.m. the air was cool, but by noon the temperature had increased 25 degrees to 68°F. What was the temperature at 7:00 a.m.?

### Written Practice

*Distributed and Integrated*

**Formulate** Write and solve equations for problems **1** and **2**.

- \* **1.** If a winter day has 10 hours of daylight, then the day has how many hours of darkness? (*Hint: A whole day has 24 hours.*)

\*2. Tamira read 6 pages before lunch. After lunch she read some more.  
 (11) If Tamira read 13 pages in all, how many pages did she read after lunch?

3. **Represent** Use digits to write the number six hundred forty-two.  
 (7)

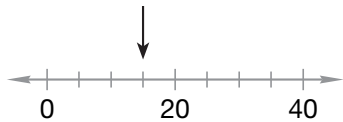
\*4. **Represent** Use digits and symbols to write this comparison:  
 (Inv. 1) "Negative twelve is less than zero."

\*5. Compare:  $-2 \bigcirc 2$   
 (Inv. 1)

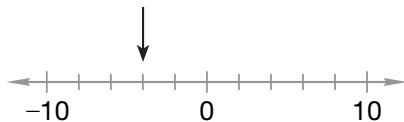
\*6. Use the digits 5, 6, and 7 to write an even number between 560 and 650.  
 (10)


\*7. **Represent** To what number is each arrow pointing?  
 (Inv. 1)

a.



b.



\*8.  **Analyze** The books were put into two stacks so that an equal number of books was in each stack. Was the total number of books an odd number or an even number? Explain your thinking.  
 (10)

$$\begin{array}{r} 9. \quad 5 \\ (2) \quad b \\ + 7 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 10. \quad n \\ (2) \quad 5 \\ + 3 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 11. \quad 7 \\ (2) \quad a \\ + 4 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 12. \quad m \\ (2) \quad 2 \\ + 8 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 13. \quad 12 \\ (6) \quad - 3 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 14 \\ (6) \quad - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 12 \\ (6) \quad - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \quad 13 \\ (6) \quad - 6 \\ \hline \end{array}$$

$$\begin{array}{r} *17. \quad 74 \\ (9) \quad + 18 \\ \hline \end{array}$$

$$\begin{array}{r} *18. \quad 93 \\ (9) \quad + 39 \\ \hline \end{array}$$

$$\begin{array}{r} 19. \quad 28 \\ (9) \quad + 45 \\ \hline \end{array}$$

$$\begin{array}{r} 20. \quad 28 \\ (9) \quad + 47 \\ \hline \end{array}$$

**Conclude** Write the next three numbers in each counting sequence:

\*21. ..., 12, 9, 6, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...  
(Inv. 3)

22. ..., 30, 36, 42, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...  
(3)

\*23. **Connect** The numbers 5, 9, and 14 form a fact family. Write two addition facts and two subtraction facts using these three numbers.  
(6)

24.  $4 + 3 + 5 + 8 + 7 + 6 + 2$   
(1)

25. **List** Show six ways to add 7, 8, and 9.  
(1)

\*26. **Multiple Choice** If  $3 + \blacktriangle = 7$  and if  $\blacksquare = 5$ , then  $\blacktriangle + \blacksquare$  equals which of the following?  
(1)

A 4

B 5

C 8

D 9

\*27. How many different odd three-digit numbers can you write using the digits 5, 0, and 9? Each digit may be used only once, and the digit 0 may not be used in the hundreds place.  
(10)

\*28. Compare. Write  $>$ ,  $<$ , or  $=$ .  
(Inv. 1)

a.  $89 \bigcirc 94$

b.  $409 \bigcirc 177$

c.  $61 \bigcirc 26$

\*29. The land areas of three counties are shown in the table.  
(7)

Write the names of the counties in order from smallest area to largest area.

**Land Area by County**

County	State	Area (sq mi)
Cass	Iowa	564
Hood River	Oregon	522
Weber	Utah	576

\*30. **Formulate** Write and solve an addition word problem. Then explain why your answer is reasonable.  
(1)

## • Missing Numbers in Subtraction

### Power Up

#### facts

Power Up A

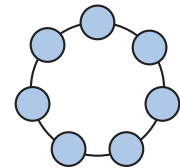
#### mental math

Add a number ending in 9 to another number in **a–f**.

- Number Sense:**  $52 + 29$
- Number Sense:**  $63 + 9$
- Number Sense:**  $14 + 39$
- Number Sense:**  $26 + 49$
- Number Sense:**  $57 + 19$
- Number Sense:**  $32 + 59$
- Money:**  $\$12 + \$10$
- Money:**  $\$12 + \$9$

#### problem solving

Choose an appropriate problem-solving strategy to solve this problem. Make a design of numbered circles like those in Lessons 10 and 11, but use seven circles instead of ten. Use the pattern “1, skip, skip, 2, skip, skip, 3, . . .” to number the circles, starting with the circle at top. Outside each circle, write the sum of the number in the circle and the two circles on either side. Describe the pattern to a classmate or write a description of the pattern.



### New Concept

Since Lesson 1 we have practiced finding missing numbers in addition problems. In this lesson we will practice finding missing numbers in subtraction problems.

### Thinking Skill

#### Discuss

Why can we add to find a missing number in a subtraction problem?

Remember that we “subtract down” to find the bottom number and “add up” to find the top number.

<b>Subtract Down</b>	↓	9	↑	<b>Add Up</b>
Nine minus six		$\frac{-6}{3}$		Three plus six
equals three.				equals nine.

We may use either “subtracting down” or “adding up” to find the missing number in a subtraction problem.

### Example 1

Find the missing number:  $14$

$$\begin{array}{r} - n \\ \hline 6 \end{array}$$

We may either “subtract down” or “add up.” Which way seems easier?

<b>Subtract Down</b>	↓	14	↑	<b>Add Up</b>
Fourteen minus		$\frac{-n}{6}$		Six plus what
what number				number equals
equals six?				fourteen?

Often it is easier to find a missing number in a subtraction problem by “adding up.” If we add 8 to 6 we get 14, so the missing number is **8**. We can check our answer by replacing  $n$  with 8 in the original problem.

$$\begin{array}{r} 14 \\ - 8 \\ \hline 6 \end{array} \text{ check}$$

Since  $14 - 8 = 6$ , we know our answer is correct.

### Example 2

Find the missing number:  $b$

$$\begin{array}{r} - 5 \\ \hline 7 \end{array}$$

Try both “subtracting down” and “adding up.”

<b>Subtract Down</b>	↓	$b$	↑	<b>Add Up</b>
What number		$\frac{-5}{7}$		Seven plus five
minus five equals				equals what
seven?				number?

Since 7 plus 5 is 12, the missing number must be **12**. We replace  $b$  with 12 in the original problem to check our answer.

$$\begin{array}{r} 12 \\ - 5 \\ \hline 7 \end{array} \text{ check}$$

## Lesson Practice

Find each missing number. Check your answers.

a.  $\frac{14}{-n} = \frac{\quad}{6}$

b.  $\frac{n}{-5} = \frac{\quad}{2}$

c.  $\frac{9}{-n} = \frac{\quad}{2}$

d.  $\frac{n}{-7} = \frac{\quad}{5}$

## Written Practice

*Distributed and Integrated*

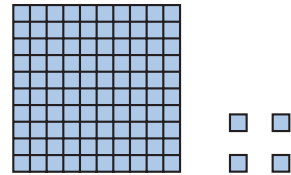
**Formulate** Write and solve equations for problems 1–3.

\*1. <sup>(11)</sup> Laura found nine acorns in the park. Then she found some more acorns in her backyard. If Laura found seventeen acorns in all, how many acorns did she find in the backyard?

\*2. <sup>(1, 9)</sup> Caterpillars change into butterflies every day at the butterfly center. In one week 35 caterpillars changed into butterflies. The next week 27 more caterpillars changed into butterflies. Altogether, how many caterpillars changed to butterflies?

\*3. <sup>(11)</sup> Demetrius used a 12-inch ruler to stir the paint in the can. When he removed the ruler, 5 inches of it were not coated with paint. How many inches of the ruler were coated with paint?

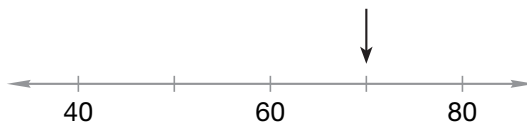
\*4. <sup>(7)</sup> **Represent** Use words and digits to write the number shown by this model:



\*5. <sup>(5)</sup> Nathan's little sister was born on the seventh day of June in 2002. Write her birth date in month/day/year form.

\*6. <sup>(4)</sup> Write a three-digit odd number less than 500 using the digits 9, 4, and 6. Which digit is in the tens place?

\*7. <sup>(Inv. 1)</sup> **Connect** To what number is the arrow pointing?





$$\begin{array}{r} 8. \quad 5 \\ (2) \quad n \\ + 6 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 9. \quad a \\ (2) \quad 2 \\ + 5 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 10. \quad 7 \\ (2) \quad 2 \\ + n \\ \hline 15 \end{array}$$

$$\begin{array}{r} 11. \quad 4 \\ (2) \quad a \\ + 2 \\ \hline 15 \end{array}$$

$$\begin{array}{r} *12. \quad n \\ (12) \quad - 6 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 13. \quad 16 \\ (6) \quad - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 14 \\ (6) \quad - 7 \\ \hline \end{array}$$

$$\begin{array}{r} *15. \quad 12 \\ (12) \quad - a \\ \hline 7 \end{array}$$

$$\begin{array}{r} *16. \quad b \\ (12) \quad - 6 \\ \hline 6 \end{array}$$

$$\begin{array}{r} *17. \quad 13 \\ (12) \quad - c \\ \hline 8 \end{array}$$

$$\begin{array}{r} *18. \quad \$48 \\ (9) \quad + \$16 \\ \hline \end{array}$$


$$\begin{array}{r} 19. \quad \$37 \\ (9) \quad + \$14 \\ \hline \end{array}$$

**Conclude** Write the next three numbers in each counting sequence:

\*20. ..., 28, 35, 42, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...  
(3)

\*21. ..., 18, 21, 24, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...  
(3)

22. How many cents is nine nickels? Count by fives.  
(3)

\*23.  **Explain** Write the following comparison using words and explain why the comparison is correct.  
(Inv. 1)

$$-3 > -5$$

\*24. Arrange these numbers from least to greatest: 0, -2, 4  
(Inv. 1)

25.  $7 + 3 + 8 + 5 + 4 + 3 + 2$   
(1)

\*26. **Multiple Choice** “Five subtracted from  $n$ ” can be written as which of the following?  
(6)

**A**  $5 - n$

**B**  $n - 5$

**C**  $5 + n$

**D**  $n + 5$

\*27. How many different three-digit numbers can you write using the digits 4, 2, and 0? Each digit may be used only once, and the digit 0 may not be used in the hundreds place.  
(10)

\*28. Compare. Write  $>$ ,  $<$ , or  $=$ .  
(Inv. 1)

**a.**  $310 \bigcirc 295$

**b.**  $56 \bigcirc 63$


**c.**  $104 \bigcirc 89$

29. The table shows the typical weight of three animals.  
(7)

Write the names of the animals in order from greatest weight to the least weight.

Typical Weight of Animals

Animal	Weight (pounds)
Fox	14
Badger	17
Otter	13

30.  **Formulate** Write and solve an addition word problem. Then explain why your answer is reasonable.  
(1)

**Early Finishers**  
*Real-World Connection*

Brianna earned \$15 walking her neighbor's dog in the afternoons. She used part of the money she earned to buy a CD. After buying the CD, Brianna has \$6 left. Write and solve an equation to find how much Brianna paid for the CD.

With the money she has left, Brianna wants to purchase a book that costs \$10. Write and solve an equation to find how much Brianna needs. Explain how you found your answer.

## • Adding Three-Digit Numbers

### Power Up

#### multiples

Power Up K

On your hundred number chart, circle all the numbers on the chart that we say when we count by 3s from 3 to 99. Do you see a pattern of even and odd numbers? Explain.

#### mental math

- a. **Number Sense:**  $30 + 60$
- b. **Number Sense:**  $74 + 19$
- c. **Number Sense:**  $46 + 9$
- d. **Number Sense:**  $63 + 29$
- e. **Number Sense:**  $42 + 50$
- f. **Number Sense:**  $16 + 39$
- g. **Money:**  $\$20 + \$20$
- h. **Money:**  $\$19 + \$20$

#### problem solving

The months of the year repeat. Twelve months after January is January of the next year. Twenty-four months after January is January again. What month is twenty-five months after January?

#### Focus Strategy: Use Logical Reasoning

**Understand** We are given this information:

1. The months of the year repeat.
2. Twelve months after January is January of the next year.
3. Twenty-four months after January is January again.

We already know the months of the year (January, February, March, and so on). We are asked to find the month that is twenty-five months after January.

**Plan** We will use *logical reasoning*. We will combine our knowledge of the months of the year with the given information to answer the question.

**Solve** We are told that twenty-four months after January is January. Twenty-five months is one month more than twenty-four months ( $24 + 1 = 25$ ). We know that one month after January is February. So **February** is twenty-five months after January.

**Check** We know our answer is reasonable because the months of the year repeat. Twenty-four months after January is January, so by using logical reasoning, we know that twenty-five months after January is February.

## New Concept

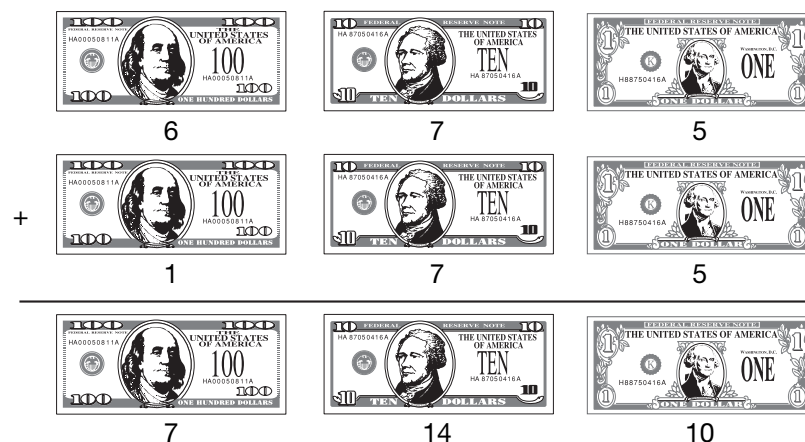
*Esmerelda and Denise were playing a game. Esmerelda had \$675. Denise landed on Esmerelda's property, so she paid Esmerelda \$175 for rent. How much money does Esmerelda have now?*

### Thinking Skill

#### Justify

Why can we use \$100 bills, \$10 bills, and \$1 bills to represent an addition problem?

We can use money manipulatives to add \$175 to \$675. The sum is 7 hundreds, 14 tens, and 10 ones.



### Thinking Skill

#### Verify

Why did we exchange ten \$1 bills for one \$10 bill?

We can exchange 10 ones for 1 ten and 10 tens for 1 hundred, giving us 8 hundreds, 5 tens, and no ones. Esmerelda has \$850.



We can also use pencil and paper to solve this problem. First we add the ones and regroup. Then we add the tens and regroup. As a final step, we add the hundreds.

Add ones. ———  
 Add tens. ———  
 Add hundreds. ———

$$\begin{array}{r}
 \$675 \\
 + \$175 \\
 \hline
 11 \\
 \hline
 \$850
 \end{array}$$

Show regrouping either above or below.

### Example

Rayetta bought a used car to drive to college. She paid \$456 to have it repainted and paid \$374 for new tires. Altogether, how much did Rayetta spend for the paint work and tires?

We begin by adding the digits in the ones column, and we move one column at a time to the left. We write the first digit of two-digit answers either above or below the next place's column. We find that Rayetta spent **\$830**.

$$\begin{array}{r}
 11 \\
 \$456 \\
 + \$374 \\
 \hline
 \$830
 \end{array}$$

### Thinking Skill

#### Discuss

In which place did we need to regroup? Explain why.



## Activity

### Adding Money

Materials needed:

- money manipulatives from Lesson 4 (from **Lesson Activities 2, 3, and 4**)

Use money manipulatives to act out the problem in the example. Then describe in writing how you can regroup the bills so that you use the fewest number of bills.

### Lesson Practice

Add:

a.  $\begin{array}{r} \$579 \\ + \$186 \\ \hline \end{array}$

b.  $\begin{array}{r} 408 \\ + 243 \\ \hline \end{array}$

c.  $\begin{array}{r} \$498 \\ + \$ 89 \\ \hline \end{array}$

d.  $\$458 + \$336$

e.  $56 + 569$

## Written Practice

*Distributed and Integrated*

\* 1. For recess, 77 students chose to play outside and 19 students chose to play in the gym. How many students were playing at recess altogether?  
 (1, 9)

\* 2. Five of the twelve students had no homework to take home on Friday.  
 (11) How many students had homework to take home?

**\*3. Represent** Use words to write the number 913.  
(7)

**\*4. Represent** Use digits to write the number seven hundred forty-three.  
(7)

**\*5. Represent** Use digits and symbols to write this comparison:  
(Inv. 1) "Seventy-five is greater than negative eighty."

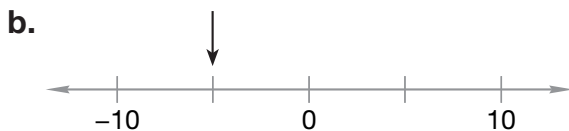
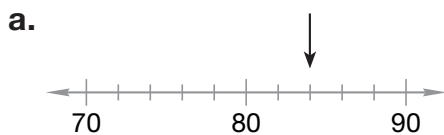
**\*6. Compare:**

(7, Inv. 1) a.  $413 \bigcirc 314$

b.  $-4 \bigcirc 3$

**7. Connect** The numbers 7, 9, and 16 form a fact family. Write two addition facts and two subtraction facts using these three numbers.  
(6)

**\*8. Represent** To what number is each arrow pointing?  
(Inv. 1)



**\*9.**  $\begin{array}{r} \$475 \\ + \$332 \\ \hline \end{array}$   
(13)

**\*10.**  $\begin{array}{r} \$714 \\ + \$226 \\ \hline \end{array}$   
(13)

**\*11.**  $\begin{array}{r} 743 \\ + 187 \\ \hline \end{array}$   
(13)

**\*12.**  $\begin{array}{r} 576 \\ + 228 \\ \hline \end{array}$   
(13)

**13.**  $\begin{array}{r} 8 \\ 5 \\ + k \\ \hline 17 \end{array}$   
(2)

**14.**  $\begin{array}{r} 4 \\ n \\ + 6 \\ \hline 15 \end{array}$   
(2)

**15.**  $\begin{array}{r} 9 \\ a \\ + 6 \\ \hline 17 \end{array}$   
(2)

**16.**  $\begin{array}{r} n \\ 3 \\ + 7 \\ \hline 16 \end{array}$   
(2)

**\*17.**  $\begin{array}{r} 8 \\ - n \\ \hline 2 \end{array}$   
(12)

**18.**  $\begin{array}{r} 17 \\ - 8 \\ \hline \end{array}$   
(6)

**19.**  $\begin{array}{r} 13 \\ - 7 \\ \hline \end{array}$   
(6)

**\*20.**  $\begin{array}{r} n \\ - 8 \\ \hline 7 \end{array}$   
(12)

**\*21.**  $\begin{array}{r} 14 \\ - n \\ \hline 6 \end{array}$   
(12)

**\*22.**  $\begin{array}{r} 16 \\ - a \\ \hline 9 \end{array}$   
(12)

**23.**  $\begin{array}{r} n \\ - 9 \\ \hline 7 \end{array}$   
(12)

**24.**  $\begin{array}{r} \$49 \\ + \$76 \\ \hline \end{array}$   
(9)

\*25. **Conclude** Write the next three numbers in each counting sequence:

(3, Inv. 1)

a. ..., 28, 35, 42, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

b. ..., 15, 10, 5, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

\*26. **Multiple Choice** Which number shows the sum of the sets below?

(7)

A 26                      B 32                      C 58                      D 13

\*27. What temperature is 5 degrees less than 1 degree?

(Inv. 1)

\*28. Brothers and sisters are siblings. The table shows the names and ages of Jeremy and his siblings.

(7)

Write the names in order from youngest to oldest.

Jeremy and his Siblings

Name	Age (in years)
Jeremy	10
Jack	8
Jackie	13

\*29. **Justify** Will the sum of three even numbers be odd or even? Explain and give several examples to support your answer.

(10)

\*30. How many different three-digit numbers can you write using the digits 0, 6, and 7? Each digit may be used only once, and the digit 0 may not be used in the hundreds place. Label your numbers as even or odd.

(10)

- Subtracting Two-Digit and Three-Digit Numbers
- Missing Two-Digit Addends

**Power Up****multiples**

Power Up K

The multiples of 4 are the numbers we say when we count by fours: 4, 8, 12, 16, and so on. On your hundred number chart, circle the multiples of 4. Which of the circled numbers are even numbers? Are all the even numbers on the chart circled?

**mental math**

Add a number ending in two zeros to another number in **a–c**.

- Number Sense:**  $300 + 400$
- Number Sense:**  $600 + 300$
- Number Sense:**  $250 + 300$
- Number Sense:**  $63 + 29$
- Number Sense:**  $28 + 49$
- Money:** Two dimes and one nickel have the same value as what coin?
- Money:** How many quarters equal one dollar?
- Money:** If one pencil costs 20¢, how much do two pencils cost?

**problem solving**

Choose an appropriate problem-solving strategy to solve this problem. Twelve months after February is February. Twenty-four months after February is February again. On February 14, Paloma's sister was 22 months old. In what month was Paloma's sister born?



## New Concepts

### Subtracting Two-Digit and Three-Digit Numbers

KimRee had \$37. She spent \$23 to buy a game. How much money did KimRee have then?

We will use bills to illustrate this problem.

KimRee had \$37.



3



7

She spent \$23.



2



3

Then she had ...



1



4

The picture shows that KimRee had 3 tens and 7 ones and that she took away 2 tens and 3 ones. We see that she had 1 ten and 4 ones left over, which is \$14.

The problem is a subtraction problem. With pencil and paper, we solve the problem this way:

First subtract ones.  
Then subtract tens.

$$\begin{array}{r} \$37 \\ - \$23 \\ \hline \$14 \end{array}$$

### Example 1

**Subtract:**  $85 - 32$

We read this problem as “eighty-five minus thirty-two.” This means that 32 is subtracted from 85. We can write the problem and its answer like this:

$$\begin{array}{r} 85 \\ - 32 \\ \hline 53 \end{array}$$

**Verify** Explain why the answer is reasonable.

## Example 2

**Subtract 123 from 365.**

The numbers in a subtraction problem follow a specific order. This problem means “start with 365 and subtract 123.” We write the problem and its answer like this:

$$\begin{array}{r} 365 \\ - 123 \\ \hline 242 \end{array}$$

**Verify** Explain why the answer is reasonable.

## Missing Two-Digit Addends

The missing addend in the problem below has two digits. We can find the missing addend one digit at a time.

$$\begin{array}{r} 56 \\ + \underline{\quad} \\ \hline 98 \end{array}$$

ones column      ↘  
tens column      ↘

Six plus what number is eight? (2)  
Five plus what number is nine? (4)

The missing digits are 4 and 2, so the missing addend is 42.

## Example 3

**Find the missing addend:**      **36**

$$\begin{array}{r} + w \\ \hline 87 \end{array}$$

The letter  $w$  stands for a two-digit number. We first find the missing digit in the ones place. Then we find the missing digit in the tens place.

$$\begin{array}{r} 36 \\ + w \\ \hline 87 \end{array}$$

Six plus what number is seven? (1)  
Three plus what number is eight? (5)

The missing addend is **51**.

We check our answer by replacing  $w$  with 51 in the original problem.

$$\begin{array}{r} 36 \\ + w \\ \hline 87 \end{array} \quad \begin{array}{r} 36 \\ + 51 \\ \hline 87 \end{array} \text{ check}$$

### Example 4

**Find the missing addend:  $m + 17 = 49$**

We want to find the number that combines with 17 to total 49.

The missing addend contains two digits. We will find the digits one at a time.

$$\begin{array}{r} m \text{ What number plus seven is nine? (2)} \\ + 17 \text{ What number plus one is four? (3)} \\ \hline 49 \end{array}$$

We find that the missing addend is **32**. We check our answer.

$$m + 17 = 49$$

$$32 + 17 = 49 \quad \text{check}$$

### Lesson Practice

**Model** Solve problems **a** and **b** using money manipulatives. Then subtract using pencil and paper.

**a.**  $\$485 - \$242$

**b.**  $\$56 - \$33$

**c.** Subtract 53 from 97.

**d.** Subtract twenty-three from fifty-four.

Find the missing addend in each problem:

**e.** 
$$\begin{array}{r} 24 \\ + q \\ \hline 65 \end{array}$$

**f.** 
$$\begin{array}{r} m \\ + 31 \\ \hline 67 \end{array}$$

**g.**  $36 + w = 99$

**h.**  $y + 45 = 99$

### Written Practice

*Distributed and Integrated*

**Formulate** Write and solve equations for problems **1** and **2**.

\***1.** <sup>(1)</sup> The surf shop had forty-two surfboards. The shop received a shipment with seventeen more surfboards. How many surfboards were at the surf shop?

\***2.** <sup>(11)</sup> Machiko saw four grasshoppers in her backyard on Monday. On Tuesday she saw some more grasshoppers. She saw a total of eleven grasshoppers on those two days. How many grasshoppers did she see on Tuesday?

\*3. Use the digits 1, 2, and 3 to write an even number less than 200. Use each digit only once.

\*4. **Connect** Use the numbers 9, 7, and 2 to write two addition facts and two subtraction facts.

\*5. Subtract seven hundred thirteen from eight hundred twenty-four.

\*6. Compare:

a.  $704 \bigcirc 407$

b.  $-3 \bigcirc -5$

7. What is the total number of days in the first two months of a common year?

\*8. **Represent** To what number is the arrow pointing?



\*9. 
$$\begin{array}{r} \$346 \\ + \$298 \\ \hline \end{array}$$

\*10. 
$$\begin{array}{r} 499 \\ + 275 \\ \hline \end{array}$$

\*11. 
$$\begin{array}{r} \$421 \\ + \$389 \\ \hline \end{array}$$

\*12. 
$$\begin{array}{r} \$506 \\ + \$210 \\ \hline \end{array}$$

\*13. 
$$\begin{array}{r} \$438 \\ - \$206 \\ \hline \end{array}$$

\*14. 
$$\begin{array}{r} 17 \\ - a \\ \hline 9 \end{array}$$

\*15. 
$$\begin{array}{r} 7 \\ + b \\ \hline 14 \end{array}$$

\*16. 
$$\begin{array}{r} 5 \\ - c \\ \hline 2 \end{array}$$

\*17. 
$$\begin{array}{r} 8 \\ + d \\ \hline 15 \end{array}$$

\*18. 
$$\begin{array}{r} 15 \\ - k \\ \hline 9 \end{array}$$

\*19. 
$$\begin{array}{r} 3 \\ n \\ + 2 \\ \hline 13 \end{array}$$

\*20. 
$$\begin{array}{r} 476 \\ - 252 \\ \hline \end{array}$$

\*21. 
$$\begin{array}{r} 47 \\ - 16 \\ \hline \end{array}$$

\*22. 
$$\begin{array}{r} 28 \\ - 13 \\ \hline \end{array}$$

\*23. 
$$\begin{array}{r} 75 \\ + t \\ \hline 87 \end{array}$$

\*24. 
$$\begin{array}{r} 24 \\ + e \\ \hline 67 \end{array}$$

\*25. **Conclude** Write the next three numbers in each counting sequence:

a.  $\dots, 81, 72, 63, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \dots$

b.  $\dots, 12, 8, 4, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \dots$

\*26. **Multiple Choice** If  $\square - 7 = 2$ , then which of these is *not* true?

(12)

A  $7 - \square = 2$

B  $\square - 2 = 7$

C  $2 + 7 = \square$

D  $\square = 7 + 2$

\*27.

(10)



**Verify**

When you add four even numbers, will the sum be even or odd? Explain why, and give several examples to support your answer.

28.

(1, 7)

A piano has 36 black keys and 52 white keys. Does a piano have more black keys or white keys? How many keys does a piano have altogether?

\*29.

(10)



**Verify**

Will the sum of three odd numbers be odd or even? Explain why, and give several examples to support your answer.

30.

(10)

How many different three-digit numbers can you write using the digits 9, 1, and 0? Each digit may be used only once, and the digit 0 may not be used in the hundreds place. Label the numbers you write as even or odd.

## Early Finishers

Real-World Connection

The Helman family took a 745-mile car trip to visit relatives. The trip took three days because they made stops to sightsee each day. On the first day, they traveled 320 miles, and on the third day, they traveled 220 miles. How many miles did they travel on the second day? Explain why your answer is reasonable.

## • Subtracting Two-Digit Numbers with Regrouping

### Power Up

**facts**

Power Up A

**count aloud**

Count by fours from 4 to 60.

**mental math**

Add a number ending in two zeros to another number in **a–c**.

a. **Number Sense:**  $400 + 500$

b. **Number Sense:**  $600 + 320$

c. **Number Sense:**  $254 + 100$

d. **Number Sense:**  $39 + 25$

e. **Number Sense:**  $19 + 27$

f. **Money:** What is the value of 3 nickels and 2 pennies?

g. **Money:** What is the value of 3 quarters?

h. **Money:** The price of a baseball glove is \$19. The price of a baseball is \$3. What is the total cost of one glove and one ball?

**problem solving**

Talmi has a total of 10 coins in his left and right pockets. He has four more coins in his right pocket than in his left pocket. How many coins does Talmi have in each pocket?

**Focus Strategy: Guess and Check**

**Understand** We are told the total number of coins (10). We are told Talmi's right pocket contains four more coins than his left pocket. We are asked to find the number of coins in each pocket.

**Plan** We can try *guessing* the numbers of coins and then *checking* whether the numbers fit the problem.

**Solve** We will use fact families to only guess pairs of numbers that have a sum of 10. We try to make a *reasonable* guess. We can eliminate the guess of 5 coins in each pocket because we know Talmai has different numbers of coins in his two pockets.

We might try guessing 6 coins for the right pocket and 4 coins for the left pocket. This guess would be wrong because it would mean Talmai has 2 more coins in one pocket than in the other pocket ( $6 - 4 = 2$ ). If we make a wrong guess, we revise our guess and check again.

For a different guess, we might try 7 coins and 3 coins. Seven coins is four more than three coins ( $7 - 3 = 4$ ), which fits the problem. This means Talmai has **7 coins in his right pocket and 3 coins in his left pocket.**

**Check** We know our answer is reasonable because 7 coins plus 3 coins totals 10 coins, and 7 coins is 4 more than 3 coins. We used fact families and the strategy of *guess and check* to solve the problem.

## New Concept

*Roberto had \$53. He spent \$24 to buy a jacket. Then how much money did Roberto have?*

We will use pictures of bills and our money manipulatives to help us understand this problem.

Roberto had \$53.



He spent \$24.



Then he had ...



### Thinking Skill

#### Discuss

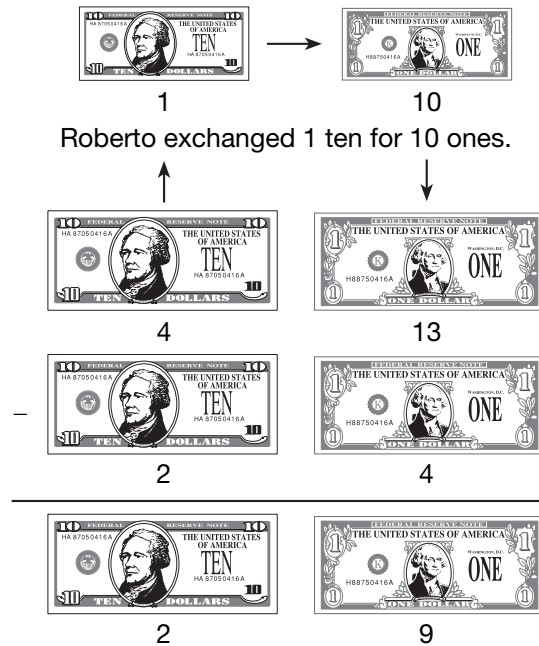
Explain why 5 tens and 3 ones equals the same number as 4 tens and 13 ones.

The picture shows that Roberto had 5 tens and 3 ones and that he took away 2 tens and 4 ones. We see that Roberto had enough tens but not enough ones. To get more ones, Roberto traded 1 ten for 10 ones.

Roberto had \$53.

He spent \$24.

Then he had ...



After trading 1 ten for 10 ones, Roberto had 4 tens and 13 ones. Then he was able to take 2 tens and 4 ones from his money to pay for the jacket. The purchase left him with 2 tens and 9 ones, which is \$29.

Trading 1 ten for 10 ones is an example of **regrouping**, or **exchanging**. (In subtraction, this process may also be called **borrowing**.) We often need to regroup when we subtract.

### Example

**Santino had \$56. He spent \$29 to repair his bike. Then how much money did Santino have?**

We subtract \$29 from \$56, writing \$56 on top.

$$\begin{array}{r} \$56 \\ - \$29 \\ \hline ? \end{array}$$

We understand that \$56 means 5 tens and 6 ones and that \$29 means 2 tens and 9 ones. Since \$6 is less than \$9, we need to regroup before we can subtract. We take \$10 from \$50 and add it to the \$6. From 5 tens and 6 ones we get 4 tens and 16 ones, which is still equal to \$56.



### Thinking Skill

#### Justify

How can we check the answer?

We subtract and get 2 tens and 7 ones, which is **\$27**. We usually show the regrouping this way:

$$\begin{array}{r} \phantom{\$}4\phantom{1}6 \\ - \$2\phantom{1}9 \\ \hline \$2\phantom{1}7 \end{array}$$

### Activity

#### Subtracting Money

Materials needed:

- money manipulatives from Lesson 4 (from **Lesson Activities 2, 3, and 4**)

Use money manipulatives to act out the problem in the example. Then describe in writing how to regroup the bills so that you can subtract.

### Lesson Practice

**Model** Use money manipulatives or draw pictures to show each subtraction:

a.	\$53	b.	\$56	c.	\$42	d.	\$60
	$- \$29$		$- \$27$		$- \$24$		$- \$27$

Use pencil and paper to find each difference:

e.	$63 - 36$	f.	$40 - 13$
g.	$72 - 24$	h.	$24 - 18$

### Written Practice

*Distributed and Integrated*

**Formulate** Write and solve equations for problems 1 and 2.

**\*1.** Jimmy found six hundred eighteen acorns under one tree. He found (1, 13) one hundred seventeen acorns under another tree. How many acorns did Jimmy find in all?

**\*2.** On the first day Rueben collected sixteen leaves. On the second day (11, 14) Rueben collected some more leaves, giving him a total of seventy-six leaves. How many leaves did he collect on the second day?

3. Use the digits 3, 6, and 7 to write an even number less than 400. Use each digit only once.

\*4. **Represent** Use words to write the number 605.

5. The smallest two-digit odd number is 11. What is the smallest two-digit even number?

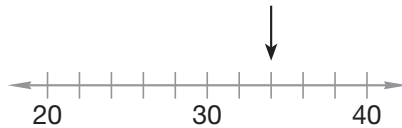
6. Compare:

a.  $75 \bigcirc 57$

b.  $5 + 7 \bigcirc 4 + 8$

\*7. Subtract 245 from 375.

\*8. To what number is the arrow pointing?



\*9. 
$$\begin{array}{r} \$426 \\ + \$298 \\ \hline \end{array}$$

10. 
$$\begin{array}{r} \$278 \\ + \$456 \\ \hline \end{array}$$

11. 
$$\begin{array}{r} 721 \\ + 189 \\ \hline \end{array}$$

\*12. 
$$\begin{array}{r} 409 \\ + 198 \\ \hline \end{array}$$

13. 
$$\begin{array}{r} d \\ + 7 \\ \hline 12 \end{array}$$

14. 
$$\begin{array}{r} 18 \\ - a \\ \hline 9 \end{array}$$

\*15. 
$$\begin{array}{r} 38 \\ + b \\ \hline 59 \end{array}$$

16. 
$$\begin{array}{r} c \\ - 4 \\ \hline 1 \end{array}$$

17. 
$$\begin{array}{r} \$456 \\ - \$120 \\ \hline \end{array}$$

\*18. 
$$\begin{array}{r} \$54 \\ - \$27 \\ \hline \end{array}$$

\*19. 
$$\begin{array}{r} 46 \\ - 28 \\ \hline \end{array}$$

\*20. 
$$\begin{array}{r} 35 \\ - 16 \\ \hline \end{array}$$

\*21. **Analyze** What is the total number of days in the last two months of the year?

\*22. **Connect** The numbers 5, 6, and 11 form a fact family. Write two addition and two subtraction facts using these three numbers.

\*23.  $3 + 6 + 7 + 5 + 4 + 8$

**Conclude** Write the next three numbers in each counting sequence:

24.  $\dots, 72, 63, 54, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \dots$

\*25. ... , -7, -14, -21, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...  
(Inv. 1)


\*26. **Multiple Choice** If  $\square = 6$  and if  $\square + \triangle = 10$ , then  $\triangle$  equals which of the following?  
(1)

A 3

B 4

C 5

D 6

\*27.  **Verify** Will the sum of an odd number and an even number be odd or even? Explain why, and give several examples to support your answer.  
(10)

28. The numbers of students who attend three different elementary schools are shown in this table:  
(7)

Enrollment

School	Number of Students
Washington	370
Lincoln	312
Roosevelt	402

Write the names of the schools in order from the least number of students to greatest.

\*29. A chimpanzee weighs about 150 pounds. A gorilla weighs about 450 pounds. Which animal weighs more? About how much more does it weigh?  
(6, 7)

30. How many different three-digit numbers can you write using the digits 4, 0, and 8? Each digit may be used only once, and the digit 0 may not be used in the hundreds place.  
(10)

## Early Finishers

Real-World Connection

The zookeeper keeps a chart showing how much food the giant panda at the zoo eats each day. The chart shows that the panda ate 61 pounds of food on Monday and 55 pounds of food on Tuesday. How much more food did the panda eat on Monday than on Tuesday? Use base ten blocks to solve the problem. Then check your answer using pencil and paper.

- Expanded Form
- More on Missing Numbers in Subtraction

**Power Up****multiples**

Power Up K

The multiples of five are the numbers we say when we count by fives. On your hundred number chart, circle the multiples of 5. Which digits are in the ones place in all the circled numbers? Which of the circled numbers are even numbers?

**mental math**

Add three numbers in **a–c**.

- Number Sense:**  $30 + 40 + 20$
- Number Sense:**  $300 + 400 + 200$
- Number Sense:**  $3 + 4 + 2$
- Review:**  $36 + 19$
- Review:**  $39 + 27$
- Money:** What is the value of 3 dimes and 1 nickel?
- Money:** What is the value of 1 quarter and 1 nickel?
- Money:** What is the total cost of a movie ticket for \$8 and a drink for \$3?

**problem solving**

Choose an appropriate problem-solving strategy to solve this problem. Sally has four coins in her pocket totaling 25¢. What coins does Sally have in her pocket?

## New Concepts

### Expanded Form

The number 365 means “3 hundreds and 6 tens and 5 ones.” We can write this as

$$300 + 60 + 5$$

This is the **expanded form** of 365.

### Example 1

**Write 275 in expanded form.**

The expanded form of 275 is **200 + 70 + 5**.

### Example 2

**Write 407 in expanded form.**

Since there are no tens, we write the following:

$$400 + 7$$

### More on Missing Numbers in Subtraction

We have found missing numbers in subtraction problems by “subtracting down” or “adding up.” We can use these methods when subtracting numbers with one or more digits.

#### Subtract Down

$$\begin{array}{r} 56 \\ - w \\ \hline 14 \end{array} \quad \begin{array}{l} \downarrow \\ \text{Six minus what number is four? (2)} \\ \text{Five minus what number is one? (4)} \end{array}$$

We find that the missing number is 42.

#### Add Up

$$\begin{array}{r} n \\ - 36 \\ \hline 43 \end{array} \quad \begin{array}{l} \uparrow \\ \text{Three plus six is what number? (9)} \\ \text{Four plus three is what number? (7)} \end{array}$$

We find that the missing number is 79.

### Example 3

**Find the missing number:**    64

$$\begin{array}{r} - w \\ \hline 31 \end{array}$$

We write the first number on top and find the missing number one digit at a time by “subtracting down” or “adding up.”

#### Thinking Skill

##### Verify

Why can we use addition to solve a subtraction problem?

$$\begin{array}{r} 64 \\ - w \\ \hline 31 \end{array}$$

Four minus what number is one? (3)

Six minus what number is three? (3)

or

$$\begin{array}{r} 64 \\ - w \\ \hline 31 \end{array}$$

One plus what number is four? (3)

Three plus what number is six? (3)

We find that the missing number is **33**. We check our work by using 33 in place of  $w$  in the original problem.

$$\begin{array}{r} 64 \\ - w \\ \hline 31 \end{array} \quad \begin{array}{r} 64 \\ - 33 \\ \hline 31 \end{array} \text{ check}$$

## Lesson Practice

Write each number in expanded form:

a. 86

b. 325

c. 507

Find each missing number:

d. 36

e. 47

f.  $m$

$$\begin{array}{r} - p \\ \hline 21 \end{array}$$

$$\begin{array}{r} - q \\ \hline 24 \end{array}$$

$$\begin{array}{r} - 22 \\ \hline 16 \end{array}$$

g.  $w - 32 = 43$

h.  $43 - x = 32$

## Written Practice

*Distributed and Integrated*

**Formulate** Write and solve equations for problems 1 and 2.

\*1. <sup>(11, 14)</sup> Twenty-three horses grazed in the pasture. The rest of the horses were in the corral. If there were eighty-nine horses in all, how many horses were in the corral?

\*2. <sup>(1, 13)</sup> Three hundred seventy-five students were standing in the auditorium. The other one hundred seven students in the auditorium were sitting down. Altogether, how many students were in the auditorium?

3. <sup>(6)</sup> Use the numbers 22, 33, and 55 to write two addition facts and two subtraction facts.

\*4. <sup>(16)</sup> **Represent** Write 782 in expanded form.

5. The largest three-digit odd number is 999. What is the smallest three-digit even number?

6. Compare:

(Inv. 1)

a.  $918 \bigcirc 819$

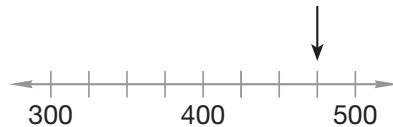
b.  $-7 \bigcirc -5$

7. Six weeks is how many days? Count by sevens.

(3)

\* 8. **Represent** To what number is the arrow pointing?

(Inv. 1)



9. 
$$\begin{array}{r} \$576 \\ + \$128 \\ \hline \end{array}$$

10. 
$$\begin{array}{r} \$243 \\ + \$578 \\ \hline \end{array}$$

11. 
$$\begin{array}{r} 186 \\ + 285 \\ \hline \end{array}$$

12. 
$$\begin{array}{r} 329 \\ + 186 \\ \hline \end{array}$$

13. 
$$\begin{array}{r} d \\ + 12 \\ \hline 17 \end{array}$$

14. 
$$\begin{array}{r} 17 \\ - a \\ \hline 9 \end{array}$$

15. 
$$\begin{array}{r} 8 \\ + b \\ \hline 14 \end{array}$$

16. 
$$\begin{array}{r} c \\ - 7 \\ \hline 2 \end{array}$$

\* 17. 
$$\begin{array}{r} 25 \\ - 19 \\ \hline \end{array}$$

\* 18. 
$$\begin{array}{r} 42 \\ - 28 \\ \hline \end{array}$$

\* 19. 
$$\begin{array}{r} 46 \\ - 18 \\ \hline \end{array}$$

\* 20. 
$$\begin{array}{r} 42 \\ - 16 \\ \hline \end{array}$$

\* 21. 
$$\begin{array}{r} 68 \\ - d \\ \hline 34 \end{array}$$

\* 22. 
$$\begin{array}{r} b \\ - 34 \\ \hline 15 \end{array}$$

\* 23. 
$$\begin{array}{r} 62 \\ - h \\ \hline 21 \end{array}$$

\* 24. 
$$\begin{array}{r} m \\ - 46 \\ \hline 32 \end{array}$$

\* 25. **Conclude** Write the next three numbers in each counting sequence:

(3)

a. ..., 16, 20, 24, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

b. ..., 16, 12, 8, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

\* 26. **Multiple Choice** If  $n - 3 = 6$ , then which of these number sentences is *not* true?

(12, 16)

A  $6 + 3 = n$

B  $3 + 6 = n$

C  $6 - 3 = n$

D  $n - 6 = 3$


27. Elevation is a measure of distance above sea level. The elevations of three cities are shown in the table:


Elevations of Cities

City	State	Elevation (in feet above sea level)
Augusta	ME	45
Troy	NY	35
Hilo	HI	38

Write the names of the cities in order from the greatest elevation to least.

- \*28. Draw a number line and mark the locations of the numbers 23, 26, and 30 by placing dots on the number line.

- \*29.  **Explain** Malika's age is an odd number. The sum of Malika's age and Elena's age is an even number. Is Elena's age an odd number or an even number? Explain how you know.

- \*30.  **Explain** Write an addition word problem for the equation  $33 + m = 51$ . Solve the problem for  $m$  and explain why your answer is reasonable.

## Early Finishers

Real-World Connection

Trisha rolled a dot cube three times. She rolled 3, 5, and 4. Write all the three-digit numbers Trisha can make using these digits one time in each number. Then write the greatest and least number in expanded form.



## • Adding Columns of Numbers with Regrouping

### Power Up

**facts**

Power Up B

**count aloud**

Count by fives from 5 to 50 and then back down to 5.

**mental math**

- a. **Number Sense:**  $200 + 300 + 400$
- b. **Number Sense:**  $240 + 200 + 100$
- c. **Number Sense:**  $36 + 20 + 9$
- d. **Number Sense:**  $45 + 10 + 29$
- e. **Number Sense:**  $56 + 20 + 19$
- f. **Number Sense:**  $24 + 39 + 10$
- g. **Money:** What is the value of 2 dimes, 2 nickels, and 2 pennies?
- h. **Money:** What is the total cost of a \$4 sandwich, a \$1 bag of pretzels, and a \$1 drink?

**problem solving**

Choose an appropriate problem-solving strategy to solve this problem. There were more than 20 but fewer than 30 math books on the shelf. Austin arranged the books into two equal stacks, and then he rearranged the books into three equal stacks. Use these clues to find how many math books were on the shelf. Explain how you found your answer.

## New Concept

We have practiced solving addition problems in which we regrouped 10 ones as 1 ten, but sometimes the sum of the digits in the ones column is 20 or more. When this happens, we move a group of two or more tens to the tens column.

### Example 1

**The number of students in four classrooms is 28, 26, 29, and 29. How many students are there in all four classrooms?**

We arrange the numbers vertically and then add the ones. The sum is 32, which is 3 tens plus 2 ones. We record the 2 in the ones place and write the 3 either above or below the tens column. Then we finish adding.

$$\begin{array}{r}
 \begin{array}{r}
 3 \text{ above} \rightarrow 3 \\
 28 \\
 26 \\
 29 \\
 29 \\
 + 29 \\
 \hline
 112
 \end{array}
 \qquad
 \begin{array}{r}
 28 \\
 26 \\
 29 \\
 + 29 \\
 \hline
 112
 \end{array}
 \end{array}$$

Altogether, there are **112 students**.

#### Thinking Skill

##### Connect

How would the answer change if we were adding dollars?

### Example 2

**Add:  $227 + 88 + 6$**

We line up the last digits of the numbers. Then we add the digits in the ones column and get 21.

$$\begin{array}{r}
 227 \\
 88 \\
 + 6 \\
 \hline
 \textcircled{21}
 \end{array}$$

The number 21 is 2 tens plus 1 one. We record the 1 in the ones place and write the 2 in the tens column. Then we add the tens and get 12 tens.

$$\begin{array}{r}
 \begin{array}{r}
 2 \\
 227 \\
 88 \\
 + 6 \\
 \hline
 \textcircled{12}1
 \end{array}
 \end{array}$$

#### Thinking Skill

##### Conclude

To add whole numbers, why do we line up the rightmost digits instead of the leftmost digits?

We record the 2 in the tens place and write the 1, which is 1 hundred, in the hundreds column. Then we finish adding.

$$\begin{array}{r} 12 \\ 227 \\ 88 \\ + 6 \\ \hline 321 \end{array}$$

### Lesson Practice

Add:

a. 
$$\begin{array}{r} 47 \\ 29 \\ 46 \\ + 95 \\ \hline \end{array}$$

b. 
$$\begin{array}{r} 28 \\ 47 \\ + 65 \\ \hline \end{array}$$

c. 
$$\begin{array}{r} 38 \\ 22 \\ 31 \\ + 46 \\ \hline \end{array}$$

d. 
$$\begin{array}{r} 438 \\ 76 \\ + 5 \\ \hline \end{array}$$

e.  $15 + 24 + 11 + 25 + 36$

### Written Practice

*Distributed and Integrated*

Write and solve equations for problems 1 and 2.

- \*1. <sup>(11)</sup> Twenty-four children visited the school science fair. The remainder of the visitors were adults. There were seventy-five visitors in all. How many visitors were adults?
- \*2. <sup>(1, 13)</sup> Four hundred seven fans sat on one side of the field at a soccer play-off game. Three hundred sixty-two fans sat on the other side of the field. Altogether, how many fans saw the game?
- \*3. <sup>(10)</sup> Use the digits 9, 2, and 8 to write an even number less than 300. You may use each digit only once. Which digit is in the tens place?
- \*4. <sup>(7, 16)</sup> **Represent** Write 813 in expanded form. Then use words to write the number.
- \*5. <sup>(10)</sup> The largest two-digit even number is 98. What is the smallest two-digit odd number?

- \*6. Represent** To what number is the arrow pointing?  
(Inv. 1)



**\*7.** 
$$\begin{array}{r} 294 \\ 312 \\ + 5 \\ \hline \end{array}$$

**8.** 
$$\begin{array}{r} \$189 \\ + \$298 \\ \hline \end{array}$$

**9.** 
$$\begin{array}{r} \$378 \\ + \$496 \\ \hline \end{array}$$

**10.** 
$$\begin{array}{r} 109 \\ + 486 \\ \hline \end{array}$$

**\*11.**  $14 + 28 + 35 + 16 + 227$   
(17)

**12.**  $14 - a = 7$   
(12)

**13.**  $8 + b = 14$   
(1)

**\*14.**  $c - 13 = 5$   
(16)

**15.** 
$$\begin{array}{r} 11 \\ - d \\ \hline 9 \end{array}$$

**16.** 
$$\begin{array}{r} e \\ - 5 \\ \hline 8 \end{array}$$

**\*17.** 
$$\begin{array}{r} 38 \\ - 29 \\ \hline \end{array}$$

**\*18.** 
$$\begin{array}{r} 57 \\ - 38 \\ \hline \end{array}$$

**19.** 
$$\begin{array}{r} 34 \\ + b \\ \hline 86 \end{array}$$

**\*20.** 
$$\begin{array}{r} 48 \\ - c \\ \hline 25 \end{array}$$

**21.** 
$$\begin{array}{r} d \\ - 46 \\ \hline 12 \end{array}$$

**22.** 
$$\begin{array}{r} y \\ - 15 \\ \hline 24 \end{array}$$

**Conclude** Write the next three numbers in each counting sequence:

**\*23.** ..., 48, 44, 40, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...  
(3)

**\*24.** ..., 12, 15, 18, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...  
(3)

**\*25. Connect** The numbers 6, 9, and 15 form a fact family. Write four addition and four subtraction facts using these three numbers.  
(6)

**\*26. Multiple Choice** Nancy is thinking of two numbers whose sum is 10 and whose difference is 2. What are the two numbers?  
(1, 6)

**A** 2 and 8

**B** 3 and 7

**C** 6 and 4

**D** 2 and 10


27. Four friends measured their resting heart rates by counting their pulses for a minute. The results shown are in the table below:


**Resting Heart Rate**

Name	Beats per Minute
Miguel	72
Victoria	68
Simon	64
Megan	76

Write the names of the friends in order from the lowest resting heart rate to the highest.

- \* 28. Draw a number line and make dots to show the locations of the numbers 13, 10, and 9.

- \* 29.  **Explain** Darrius's age is an even number. The sum of Darrius's age and Keb's age is an even number. Is Keb's age an odd number or an even number? Explain how you know.

- \* 30.  **Explain** Write an addition word problem for the equation  $n + 10 = 25$ . Solve the problem for  $n$ , and explain why your answer is reasonable.

**Early Finishers**  
Real-World Connection

Mr. Sanchez adds fresh fruit to a special display in the grocery store several times a day. One day he added 102 oranges, 115 apples, 53 pears, 87 peaches, and 44 grapefruit to the display. How many pieces of fruit did he add to the display that day?

## • Temperature

### Power Up

#### multiples

Power Up K

On your hundred number chart, circle the multiples of three. Draw an “X” on the multiples of four. Shade the boxes that have numbers with both a circle and an X. What do you notice about the number 12?

#### mental math

- Number Sense:**  $250 + 300 + 100$
- Number Sense:**  $20 + 36 + 19$
- Number Sense:**  $76 + 9 + 9$
- Number Sense:**  $64 + 9 + 10$
- Number Sense:**  $27 + 19 + 20$
- Number Sense:**  $427 + 200$
- Money:** What is the value of 1 quarter, 2 dimes, and 1 nickel?
- Money:** Each package of soccer shin guards is \$9. What is the cost of two packages of shin guards?

#### problem solving

Choose an appropriate problem-solving strategy to solve this problem. Name the date that is eleven months after August 15, 2008.

### New Concept

A **scale** is a type of number line often used for measuring. Scales are found on rulers, gauges, thermometers, speedometers, and many other instruments. To read a scale, we must first determine the distance between the marks on the scale. Then we can find the values of all the marks on the scale.

We use a thermometer to measure temperature. Temperature is usually measured in degrees **Fahrenheit** ( $^{\circ}\text{F}$ ) or in degrees **Celsius** ( $^{\circ}\text{C}$ ). On many thermometers, the distance between the tick marks is two **degrees**.

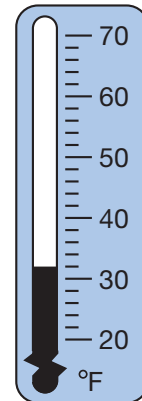
### Example 1

#### Math Language

A *degree* is a unit for measuring temperature and is shown using the degree symbol ( $^{\circ}$ )

**What temperature is shown on this Fahrenheit thermometer?**

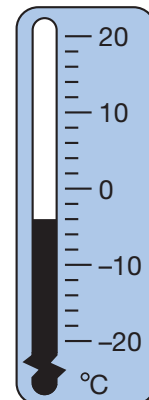
There are five spaces between  $30^{\circ}$  and  $40^{\circ}$  on this scale, so each space cannot equal one degree. If we try counting by twos, we find that our count matches the scale. We count up by twos from  $30^{\circ}$  and find that the temperature is  **$32^{\circ}\text{F}$** . Water freezes at  $32^{\circ}\text{F}$ .



### Example 2

**What temperature is shown on this Celsius thermometer?**

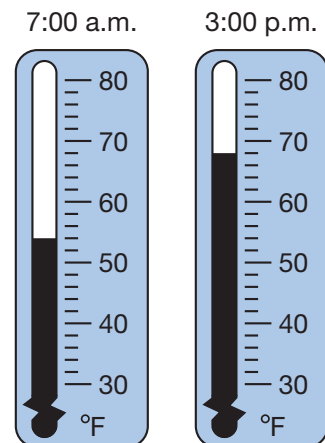
Most of the world uses the Celsius scale to measure temperature. On this thermometer we see that the tick marks are also two degrees apart. If we count down by twos from zero, we find that the temperature shown is four degrees below zero, which we write as  **$-4^{\circ}\text{C}$** . Water freezes at  $0^{\circ}\text{C}$ , so  $-4^{\circ}\text{C}$  is below freezing.



### Example 3

**Corina looked at the thermometer outside her window at 7:00 a.m. and again when she returned from school at 3:00 p.m. How many degrees warmer was the temperature at 3:00 p.m. than at 7:00 a.m.?**

The 7:00 a.m. temperature was  $54^{\circ}\text{F}$ . The 3:00 p.m. temperature was  $68^{\circ}\text{F}$ . We may solve an equation or count up from  $54^{\circ}$  to  $68^{\circ}$  to find that the temperature was  **$14^{\circ}$  warmer** at 3:00 p.m.



## Activity

### Measuring Temperature

Materials needed:

- **Lesson Activity 14**
- outside thermometer (Fahrenheit or Celsius)

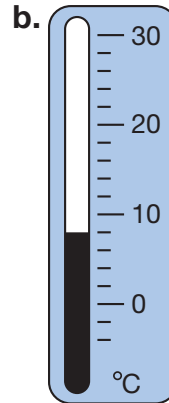
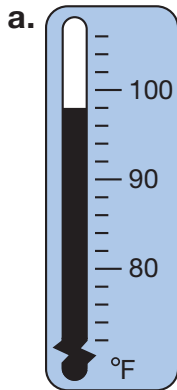
Use a thermometer to measure the temperature outside your classroom for a week. Measure a morning temperature at the same time each day and an afternoon temperature at the same time each day.

Record the temperatures each day on **Lesson Activity 14**. Record the difference between the morning and afternoon temperature each day as well.

At the end of the week, write two conclusions about the data you collected.

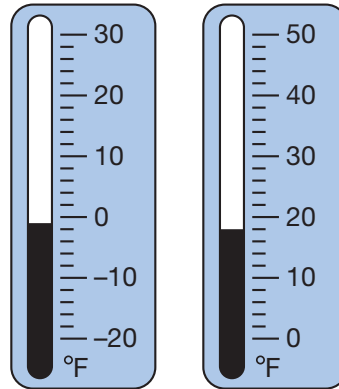
### Lesson Practice

What temperature is shown on each of these thermometers? Include correct units.





- c. These thermometers show the average daily minimum and maximum temperatures in Duluth, Minnesota, during the month of January. What are those temperatures? What is the difference between the two temperatures shown?



- d. Using the temperatures from problem c, find the difference between the average daily minimum temperature and the average daily maximum temperature in Duluth during January.

## Written Practice

*Distributed and Integrated*

**Formulate** Write and solve equations for problems 1 and 2.

- \* 1. <sup>(11, 14)</sup> Tomas ran to the fence and back in 58 seconds. If it took Tomas 21 seconds to run to the fence, how many seconds did it take him to run back from the fence?
2. <sup>(1, 13)</sup> Two hundred ninety-seven boys and three hundred fifteen girls attend Madison School. How many children attend Madison School?
- \* 3. **Connect** <sup>(6)</sup> Use the numbers 8, 17, and 9 to write two addition facts and two subtraction facts.
- \* 4. <sup>(4)</sup> The tens digit is 4. The ones digit is 9. The number is between 200 and 300. What is the number?
- \* 5. **Predict** <sup>(3, 5)</sup> What is the eighth number in the following counting sequence? Describe the pattern you observe.

4, 8, 12, 16, ...

- \* 6. Represent** To what number is the arrow pointing?  
(Inv. 1)



7. 
$$\begin{array}{r} \$392 \\ + \$278 \\ \hline \end{array}$$

8. 
$$\begin{array}{r} \$439 \\ + \$339 \\ \hline \end{array}$$

9. 
$$\begin{array}{r} 774 \\ + 174 \\ \hline \end{array}$$

10. 
$$\begin{array}{r} 389 \\ + 398 \\ \hline \end{array}$$

\* 11. 
$$\begin{array}{r} 13 \\ (17) \quad 25 \\ 46 \\ 25 \\ + 29 \\ \hline \end{array}$$

12. 
$$\begin{array}{r} 18 \\ (16) \quad - a \\ \hline 12 \end{array}$$

13. 
$$\begin{array}{r} 8 \\ (1) \quad + b \\ \hline 16 \end{array}$$

14. 
$$\begin{array}{r} c \\ (12) \quad - 5 \\ \hline 3 \end{array}$$

\* 15. 
$$\begin{array}{r} 62 \\ (15) \quad - 48 \\ \hline \end{array}$$

\* 16. 
$$\begin{array}{r} 82 \\ (15) \quad - 58 \\ \hline \end{array}$$

17. 
$$\begin{array}{r} 28 \\ (17) \quad 36 \\ 57 \\ + 47 \\ \hline \end{array}$$

18. 
$$\begin{array}{r} 35 \\ (16) \quad - y \\ \hline 14 \end{array}$$

19. 
$$\begin{array}{r} 45 \\ (14) \quad + p \\ \hline 55 \end{array}$$

\* 20. 
$$\begin{array}{r} 75 \\ (16) \quad - l \\ \hline 42 \end{array}$$

\* 21. 
$$\begin{array}{r} c \\ (16) \quad - 47 \\ \hline 31 \end{array}$$

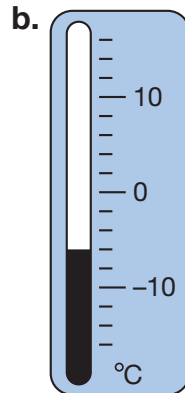
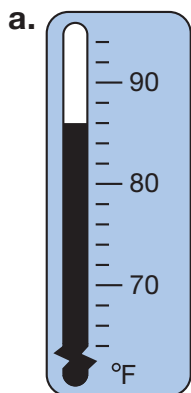
22. 
$$\begin{array}{r} e \\ (14) \quad + 15 \\ \hline 37 \end{array}$$

- \* 23. **Represent** Write 498 in expanded form.  
(16)

24. Compare:  
(Inv. 1) a.  $423 \bigcirc 432$

b.  $3 \bigcirc -3$

- \* 25. These thermometers show the highest Fahrenheit temperature and the lowest Celsius temperature recorded at a school last year. What were those temperatures?  
(18)



- \*26. **Multiple Choice** Which of these numbers is an odd number that is greater than 750?  
(10)
- A 846                      B 864                      C 903                      D 309

27. Write these numbers in order from greatest to least:  
(7)

166 48 207 81

- \*28. **Formulate** Lexington, Kentucky, receives an average of 46 inches of precipitation each year. Huron, South Dakota, receives an average of 25 fewer inches. Write and solve an equation to find the average amount of precipitation Huron receives each year.  
(15)

29. Write a subtraction number sentence using the numbers 15 and 10.  
(12)

- \*30. How many odd numbers are greater than 1 and less than 20?  
(10)

## Early Finishers

Real-World Connection

If the Celsius temperature is known, we can estimate the Fahrenheit temperature by doubling the Celsius temperature and adding 30.

- Using this method, estimate the Fahrenheit temperature at which water freezes, if we know that water freezes at  $0^{\circ}\text{C}$ . Explain how you know your estimate is reasonable.
- The average temperature in Austin, Texas, for the month of November is  $20^{\circ}\text{C}$ . Explain how you can find the estimated average Fahrenheit temperature in Austin, Texas, for that same month. Then use the method to find the estimated Fahrenheit temperature.

## • Elapsed-Time Problems

### Power Up

#### multiples

Power Up K

The multiples of six are 6, 12, 18, and so on. On your hundred number chart, circle the numbers that are multiples of six. Which of the circled numbers are also multiples of five?

#### mental math

- Number Sense:**  $27 + 100$
- Number Sense:**  $63 + 200$
- Number Sense:**  $28 + 20 + 300$
- Number Sense:**  $36 + 9 + 200$
- Number Sense:**  $48 + 29 + 300$
- Number Sense:** What number should be added to 2 to get a total of 10?
- Money:** What is the value of 1 dime, 1 nickel, and 3 pennies?
- Money:** What is the total cost of a 55¢ apple and a 40¢ milk?

#### problem solving

Choose an appropriate problem-solving strategy to solve this problem. Matsu has eight coins in his pocket totaling 16¢. What coins does Matsu have in his pocket?

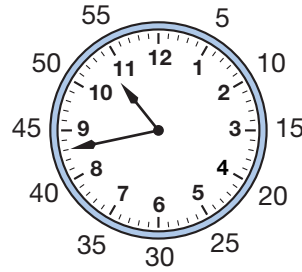
### New Concept

The scale on a clock is actually two scales in one. One scale marks hours and is usually numbered. The other scale marks minutes and seconds and is usually not numbered. On the next page, we have numbered the scale for minutes and seconds outside the clock. Notice that on this scale we count by fives to go from one big mark to the next. Counting by fives can help us find the number of minutes before or after the hour.

### Reading Math

We can write or say the time shown on this clock in different ways:

- 10:43
- 43 minutes after 10:00
- 17 minutes to 11:00



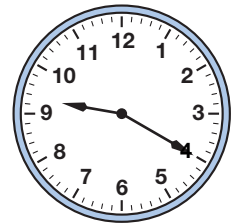
To tell time, we read the position of the short hand on the hour scale and the position of the long hand on the minute scale. If the clock also has a hand for seconds, we can read its position on the minute scale, which is also the second scale.

To write the time of day, we write the hour followed by a colon. Then we write two digits to show the number of minutes after the hour. We use the abbreviations **a.m.** for the 12 hours before noon and **p.m.** for the 12 hours after noon. This form is referred to as **digital form**. We write **noon** as 12:00 p.m., and **midnight** is written as 12:00 a.m.

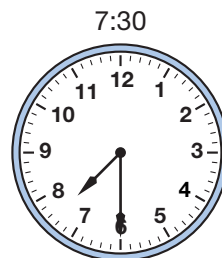
### Example 1

**If it is evening, what time is shown by the clock?**

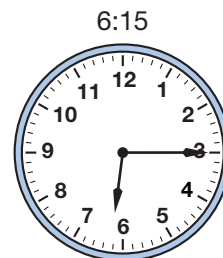
Since the short hand is between the 9 and the 10, we know it is after 9 p.m. and before 10 p.m. For the long hand, we count 5, 10, 15, 20 minutes after 9:00 p.m. The clock shows **9:20 p.m.**



Sixty minutes is one hour, 30 minutes is half an hour, and 15 minutes is a quarter of an hour. If the time is 7:30, we might say that the time is “half past seven.” At 6:15 we might say that the time is a “quarter after six.”

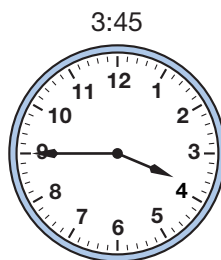


“Half past seven”



“A quarter after six”

Sometimes, when it is getting close to the next hour, we say how many minutes it is until the next hour. When the time is 5:50, we might say, “It is ten minutes to six.” When it is 3:45, we might say, “It is a quarter to four.”



“A quarter to four”

**Represent** Sketch a clock that shows 11:15.

### Example 2

**Use digital form to show what time it is at a quarter to nine in the evening.**

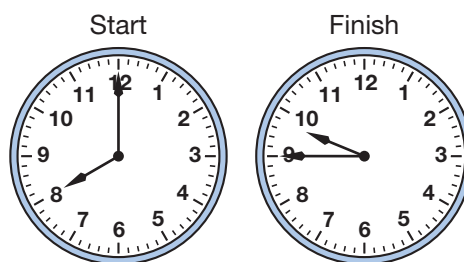
A quarter to nine is 15 minutes before nine. In the evening, this time is **8:45 p.m.**

**Represent** Draw a picture of a clock that shows the time as a quarter to nine in the evening.

Suppose Yolis’s soccer practice starts at 4:00 p.m. and ends at 5:00 p.m. The amount of time from the beginning to the end of her practice is called the elapsed time. **Elapsed time** is the difference between two points in time.

### Example 3

**Hector participated in a walk-a-thon fundraiser on Saturday morning. The clocks show the time he started and the time he finished. How many hours and minutes did Hector walk?**



Hector started at 8:00 a.m. and finished at 9:45 a.m. From 8:00 a.m. to 9:00 a.m. is one hour. From 9:00 a.m. to 9:45 a.m. is 45 minutes. We add the two amounts of time together and find that Hector walked for **1 hour 45 minutes.**

# Activity

## Finding Elapsed Time

Material needed:

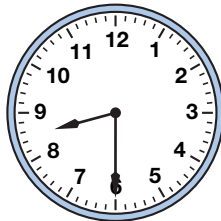
- Lesson Activity 17

Use **Lesson Activity 17** to label the hours and draw hands on two clocks, one showing the time your school starts and the other showing the time your school ends. Then calculate the number of hours and minutes from the start to the end of school.

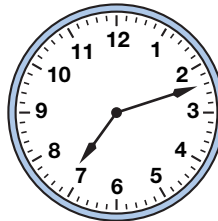
## Lesson Practice

If it is morning, what time is shown by each clock?

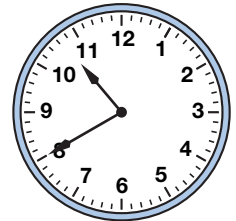
a.



b.

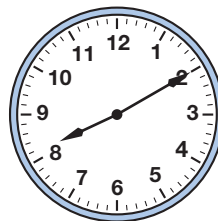


c.

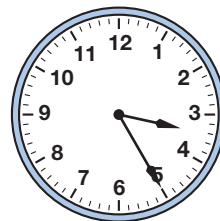


- d. Use digital form to show what time it is at ten minutes to nine in the evening.
- e. How many hours equal a whole day?
- f. How many minutes equal an hour?
- g. How many seconds equal a minute?
- h. Latoya's school day begins at the time shown on the left and ends at the time shown on the right. How long is a school day at Latoya's school? You may use your student clock to solve.

Start



Finish



Write and solve equations for problems 1 and 2.

\*1. **Formulate** <sup>(11)</sup> On the first day, Shaquana read fifty-one pages. She read some more pages on the second day. She read seventy-six pages in all. How many pages did she read on the second day?

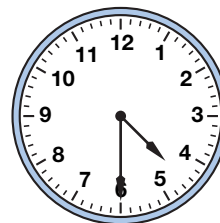
\*2. <sup>(11, 14)</sup> Twelve of the twenty-seven children in Room 9 are boys. How many girls are in Room 9?

\*3. <sup>(6)</sup> If  $a + b = 9$ , then what is the other addition fact for  $a$ ,  $b$ , and 9? What are the two subtraction facts for  $a$ ,  $b$ , and 9?

\*4. **Represent** <sup>(7, 16)</sup> Write 905 in expanded form. Then use words to write the number.

\*5. <sup>(Inv. 1)</sup> Use digits and symbols to write this comparison: "One hundred twenty is greater than one hundred twelve."

\*6. <sup>(19)</sup> After school on Wednesday, Jana began her homework at the time shown on the clock. She finished her homework at 5:20 p.m. How much time did it take Jana to finish her homework?



\*7. <sup>(18)</sup> Water freezes at  $32^\circ$  on the Fahrenheit scale. At what temperature on the Celsius scale does water freeze?

$$\begin{array}{r} 8. \quad \$468 \\ (13) \quad + \$293 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad 468 \\ (13) \quad + 185 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad \$187 \\ (13) \quad + \$698 \\ \hline \end{array}$$

$$\begin{array}{r} 11. \quad 14 \\ (12) \quad - a \\ \hline 7 \end{array}$$

$$\begin{array}{r} 12. \quad 8 \\ (1) \quad + b \\ \hline 16 \end{array}$$

$$\begin{array}{r} 13. \quad c \\ (12) \quad - 8 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 14. \quad 14 \\ (12) \quad - d \\ \hline 9 \end{array}$$

$$\begin{array}{r} *15. \quad 74 \\ (15) \quad - 58 \\ \hline \end{array}$$

$$\begin{array}{r} *16. \quad \$44 \\ (15) \quad - \$28 \\ \hline \end{array}$$

$$\begin{array}{r} *17. \quad 23 \\ (15) \quad - 18 \\ \hline \end{array}$$

$$\begin{array}{r} *18. \quad \$62 \\ (15) \quad - \$43 \\ \hline \end{array}$$



$$\begin{array}{r} *19. \quad 25 \\ \quad \quad 28 \\ \quad \quad 46 \\ \hline + 88 \end{array}$$

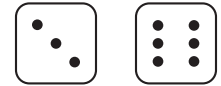
$$\begin{array}{r} 20. \quad 45 \\ \quad \quad - p \\ \hline \quad \quad 21 \end{array}$$

$$\begin{array}{r} 21. \quad 13 \\ \quad \quad + b \\ \hline \quad \quad 37 \end{array}$$

$$\begin{array}{r} *22. \quad f \\ \quad \quad - 45 \\ \hline \quad \quad 32 \end{array}$$

23. Four dollars equals how many quarters? Count by fours.  
(3)

\*24. **Connect** Write a number sentence for this picture:  
(1)



\*25. **Conclude** Write the next three numbers in each counting sequence and explain the patterns you see.  
(3, Inv. 1)

a. ..., 8, 16, 24, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

b. ..., 8, 6, 4, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

\*26. **Multiple Choice** If  $9 - \triangle = 4$ , then which of these is *not* true?  
(7)

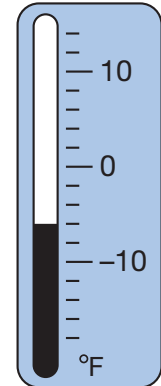
A  $9 - 4 = \triangle$

B  $\triangle - 4 = 9$

C  $4 + \triangle = 9$

D  $\triangle + 4 = 9$

\*27. The thermometer shows the low temperature on a cold winter day in Fargo, North Dakota. What was the low temperature that day?  
(18)



\*28. **Represent** Write the expanded form of 709.  
(16)

29. How many different arrangements of three letters can you write using the letters e, i, and o? The different arrangements you write do not need to form words.  
(3)

30. The numbers of goals three hockey players scored during their professional careers are shown in the table:  
(7)

**Career Goals Scored**

Player	Number of Goals
Phil Esposito	717
Wayne Gretzky	894
Marcel Dionne	731

Write the number of goals scored from least to greatest.

## • Rounding

### Power Up

**facts**

Power Up B

**count aloud**

Count by threes from 3 to 30 and then back down to 3.

**mental math**

- a. **Number Sense:**  $56 + 400$
- b. **Number Sense:**  $154 + 200$
- c. **Number Sense:**  $54 + 29$
- d. **Number Sense:**  $35 + 9 + 200$
- e. **Number Sense:**  $48 + 19 + 200$
- f. **Number Sense:** What number should be added to 3 to get a total of 10?
- g. **Money:** What is the value of one quarter and 4 dimes?
- h. **Money:** What is the total cost of a 39¢ stamp and a 20¢ envelope?

**problem solving**

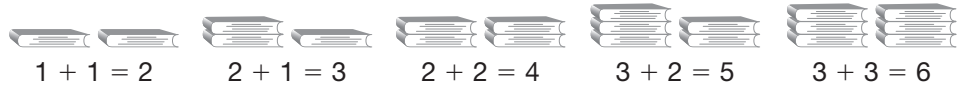
The class's math books were placed neatly on the shelf in two stacks. D'Karla saw the stacks and knew without counting that there was an even number of books. How did she know?

**Focus Strategy: Make It Simpler**

**Understand** We are told D'Karla knew there was an even number of books in two stacks without counting. We are asked to explain how she knew.

**Plan** We will begin with a simpler problem to make observations about even numbers of objects. We will explain how D'Karla knew there was an even number of books without counting.

**Solve** We might think, “Two books can be placed side by side ( $1 + 1$ ). Three books can make unequal stacks of 2 books and 1 book ( $2 + 1$ ). Four books can make equal stacks of 2 books each ( $2 + 2$ ). Five books can only make unequal stacks ( $3 + 2$  or  $4 + 1$ ). Six books can make two equal stacks of 3 books each ( $3 + 3$ ).”



We notice that 2, 4, and 6 books can be placed into equal stacks. If all the books are the same thickness (like a class’s math books), we expect that the stacks would be equally tall.

We wonder, “Can any even number of books be placed into two equal stacks?” The answer is yes—8 books can make two stacks of 4 books each, 10 books can make two stacks of 5 books each, and 12 books can make two stacks of 6 books each. We have *made a generalization* that even numbers of objects can be divided into two equal groups.

D’Karla knew that two stacks of equal height meant there was an even number of books.

**Check** We know our answer is reasonable because we made observations to find that an even number of objects can be divided into two equal groups. Our strategy can be described as making it simpler. We applied our observations about even numbers of objects to the problem.

## New Concept

### Math Language

We often use rounded amounts instead of exact amounts because they are easier to work with and to understand.

One of the sentences below uses an *exact amount*. The other sentence uses a *rounded number*. Which sentence below uses the rounded amount?

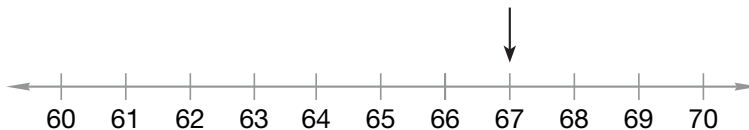
The radio costs about \$70.

The radio costs \$68.47.

The first sentence uses the rounded amount. Sometimes we choose to round an amount to the nearest multiple of ten. The **multiples** of ten are the numbers we say when we count by tens. Here we show some multiples of ten:

10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, ...

To **round** a number to the nearest ten, we choose the closest number that ends in zero. A number line can help us understand rounding. We will use the number line below to help us round 67 to the nearest ten.

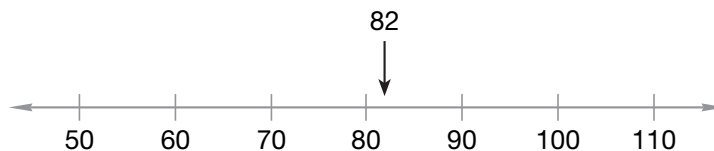


We see that 67 is between 60 and 70. Since 67 is closer to 70 than it is to 60, we say that 67 is “about 70.” When we say this, we have rounded 67 to the nearest ten.

### Example 1

**Eighty-two people attended the matinee at the movie theater. About how many people attended the matinee?**

Rounding to the nearest ten means rounding to a number we would say when counting by tens (10, 20, 30, 40, and so on). We will use a number line marked off in tens to picture this problem.



We see that 82 is between 80 and 90. Since 82 is closer to 80 than it is to 90, we round 82 to 80. About **80 people** attended the matinee.

### Example 2

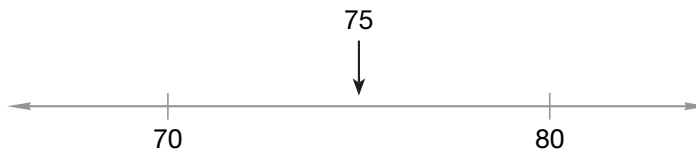
#### Thinking Skill

#### Summarize

Using your own words, explain how to round to the nearest ten.

**Round 75 to the nearest ten.**

Seventy-five is halfway between 70 and 80.



Although the number we are rounding is halfway between 70 and 80, the rule is to round up. This means 75 rounds to **80**.

Sometimes we want to round dollars and cents to the nearest dollar. To find the nearest dollar, we look closely at the number of cents. To determine whether \$7.89 is closer to \$7 or to \$8, we ask ourselves whether 89 cents is more than or less than half a dollar. Half a dollar is 50 cents. Since 89 cents is more than half a dollar, \$7.89 is closer to \$8 than \$7. To round money amounts to the nearest dollar, we round up if the number of cents is 50 or more. We round down if the number of cents is less than 50.

### Example 3

Round each amount of money to the nearest dollar:

a. \$6.49

b. \$12.95

c. \$19.75

a. The number of cents is less than 50. We round down to **\$6**.

b. The number of cents is more than 50. We round up to **\$13**.

c. The number of cents is more than 50. We round up to the next dollar, which is **\$20**.

Sometimes we want to round money to amounts other than to the nearest dollar. For example, we might choose to round \$6.49 to \$6.50 since \$6.50 is very close to \$6.49 and is fairly easy to add and subtract.

### Example 4

Round each amount of money to the nearest 25 cents:

a. \$3.77

b. \$7.48

c. \$5.98

Let's imagine that we have only dollar bills and quarters, and that we want to make the amount of money closest to each given amount.

a. The closest we can get to \$3.77 is **\$3.75**.

b. The closest we can get to \$7.48 is **\$7.50**.

c. The closest we can get to \$5.98 is **\$6.00**.

### Lesson Practice

#### Represent

Round each number to the nearest ten. For each problem, draw a number line to show your work.

a. 78

b. 43

c. 61

d. 45

Round each amount of money to the nearest dollar:

e. \$14.29

f. \$8.95

g. \$21.45

h. \$29.89

Round each amount of money to the nearest 25 cents:

i. \$12.29

j. \$6.95

k. \$5.45

l. \$11.81

### Written Practice

*Distributed and Integrated*

Write and solve equations for problems 1 and 2.

\* 1.  
(11, 14)

#### Formulate

A bakery employee baked seventy-two raisin muffins in two batches. Twenty-four muffins were baked in the first batch. How many muffins were baked in the second batch?

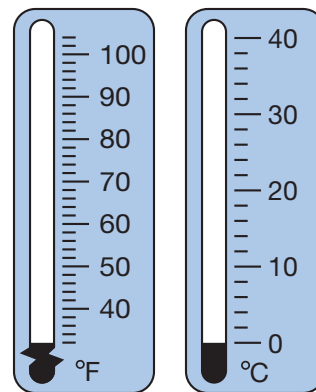
**\*2.** <sup>(1, 13)</sup> Four hundred seventy-six people attended the Friday evening performance of a school play. Three hundred ninety-seven people attended the Saturday evening performance. Altogether, how many people attended those performances?

**3.** <sup>(4)</sup> The ones digit is 5. The tens digit is 6. The number is between 600 and 700. What is the number?

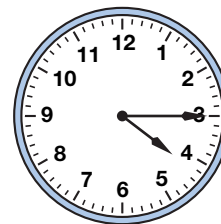
**4.** **Represent** <sup>(7, 16)</sup> Write 509 in expanded form. Then use words to write the number.

**\*5.** **Represent** <sup>(Inv. 1)</sup> Use digits and symbols to write this comparison:  
*Negative twenty is less than ten.*

**\*6.** <sup>(18)</sup> The temperature one winter day in Iron Mountain, Michigan, is shown on the thermometer. Write the temperature in degrees Fahrenheit and in degrees Celsius.



**\*7.** **Connect** <sup>(19)</sup> On Wednesday afternoons in September, flag football practice begins at the time shown on the clock and ends at 5:40 p.m. How long is practice on those days?



**\*8.** **Explain** <sup>(20)</sup> Round each number to the nearest ten and explain how you rounded each number.

a. 47

b. 74

**9.** <sup>(13)</sup>

$$\begin{array}{r} \$476 \\ + \$285 \\ \hline \end{array}$$

**10.** <sup>(13)</sup>

$$\begin{array}{r} \$185 \\ + \$499 \\ \hline \end{array}$$

**11.** <sup>(13)</sup>

$$\begin{array}{r} 568 \\ + 397 \\ \hline \end{array}$$

**12.** <sup>(13)</sup>

$$\begin{array}{r} 478 \\ + 196 \\ \hline \end{array}$$

**13.** <sup>(12)</sup>

$$\begin{array}{r} 17 \\ - a \\ \hline 9 \end{array}$$

**14.** <sup>(12)</sup>

$$\begin{array}{r} 14 \\ - b \\ \hline 14 \end{array}$$

**15.** <sup>(12)</sup>

$$\begin{array}{r} 13 \\ - c \\ \hline 6 \end{array}$$

**\*16.** <sup>(15)</sup>

$$\begin{array}{r} \$35 \\ - \$28 \\ \hline \end{array}$$

$$\begin{array}{r} *17. \quad 23 \\ (15) \quad - 15 \\ \hline \end{array}$$

$$\begin{array}{r} *18. \quad 63 \\ (15) \quad - 36 \\ \hline \end{array}$$

$$\begin{array}{r} *19. \quad 74 \\ (15) \quad - 59 \\ \hline \end{array}$$

$$\begin{array}{r} 20. \quad m \\ (14) \quad + 22 \\ \hline 45 \end{array}$$

$$\begin{array}{r} *21. \quad k \\ (16) \quad - 15 \\ \hline 32 \end{array}$$

$$\begin{array}{r} *22. \quad 47 \\ (16) \quad - k \\ \hline 34 \end{array}$$

$$\begin{array}{r} 23. \quad 28 \\ (17) \quad 36 \\ \hline 44 \\ + 58 \\ \hline \end{array}$$

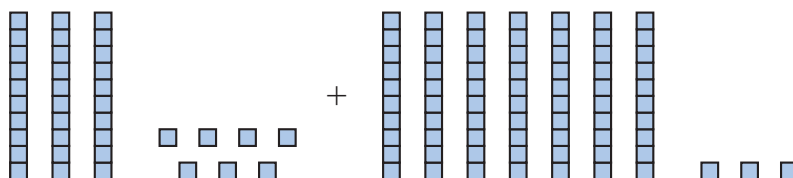
$$\begin{array}{r} 24. \quad 49 \\ (17) \quad 28 \\ \hline 32 \\ + 55 \\ \hline \end{array}$$

- \*25. Round each amount of money to the nearest dollar:

(20) a. \$25.67

b. \$14.42

- \*26. **Multiple Choice** Which number sentence describes this model?  
(7, 9)



A  $307 + 703 = 1010$

B  $37 + 73 = 100$

C  $37 + 73 = 110$

D  $37 + 73 = 1010$

27. How many different arrangements of three letters can you write using the letters b, r, and z? Each letter may be used only once, and the different arrangements you write do not need to form words.

- \*28. Round each amount of money to the nearest 25 cents:

(20) a. \$7.28


b. \$4.48

29. This table shows the land areas in square miles of four islands:

Islands of the World

Name	Location	Area (sq mi)
Micronesia	Pacific Ocean	271
Isle of Youth	Caribbean Sea	926
Isle of Man	Atlantic Ocean	227
Reunion	Indian Ocean	970

Write the names of the islands in order from greatest to least land area.

- \*30.  **Formulate** Write and solve an addition word problem that has a sum of 18.  
(1)

Focus on

• Units of Length and Perimeter

A ruler is a tool used to measure length. In your desk you might have an *inch* ruler. Many inch rulers are one *foot* long. Twelve inches equals one foot. You might also have a yardstick in your classroom. A **yard** is three feet, which is 36 inches. A *mile* is a much larger unit of length. One mile is 5280 feet. Inches, feet, yards, and miles are units of length in the **U.S. Customary System**.

U.S. Customary Units of Length

Abbreviations	Equivalents
inch... in.	12 in. = 1 ft
foot... ft	3 ft = 1 yd
yard... yd	36 in. = 1 yd
mile... mi	5280 ft = 1 mi



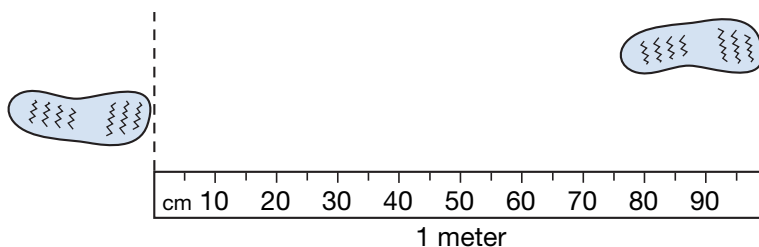
Visit [www.SaxonMath.com/Int4Activities](http://www.SaxonMath.com/Int4Activities) for an online activity.

1. A big step is about one yard. Tony walked the length of the room in 5 big steps. The room was about how many yards long? About how many feet long?
2. The electrician placed the light switch 4 feet above the floor. How many inches is four feet?
3. A mile is 5280 feet. How many feet is 2 miles?

The **metric system** is the system of measurement used by most of the world and is especially important in science. The basic unit of length in the metric system is the **meter**. You might have a meterstick in your classroom.

4. Use a yardstick and a meterstick to compare a yard and a meter. Which is longer?
5. Howie ran 100 yards. Jonah ran 100 meters. Who ran farther?

**Model** If you take a BIG step, you move about one meter. Place a meterstick on the floor, and practice taking a step that is one meter long.





6. **Estimate** What is the length of your classroom in meters? Make an estimate by taking one-meter steps along the length of the classroom.

In your desk you may have a **centimeter** ruler. A centimeter is a small part of a meter. One hundred centimeters equals one meter (just as 100 *cents* equals one dollar).

7. How many centimeters equal one meter?
8. Use an inch ruler and a centimeter ruler to compare an inch and a centimeter. Which is longer?
9. **Estimate** A ruler that is one foot long is about how many centimeters long?
10. **Estimate** Use an inch ruler to measure the length of a sheet of paper. About how many inches long is it?
11. Use a centimeter ruler to measure the length of your paper. About how many centimeters long is it?
12. **Estimate** Use inch and centimeter rulers to measure this picture of a pencil. The pencil is about
- how many inches long?
  - how many centimeters long?



13. **Estimate** Use your rulers to measure a dollar bill. A dollar bill is about
- how many inches long?
  - how many centimeters long?

Centimeter rulers and metersticks sometimes have small marks between the centimeter marks. The small marks are one **millimeter** apart. A dime is about one millimeter thick. Ten millimeters equals one centimeter, and 1000 millimeters equals a meter. We will learn more about millimeters in a later lesson.

To measure long distances, we can use **kilometers**. A kilometer is 1000 meters, which is a little more than half a mile.

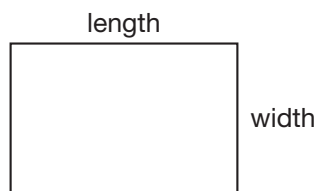
**Metric Units of Length**

Abbreviations	Equivalents
millimeter..... mm	10 mm = 1 cm
centimeter .... cm	1000 mm = 1 m
meter ..... m	100 cm = 1 m
kilometer..... km	1000 m = 1 km

14. **Estimate** About how many BIG steps would a person take to walk a kilometer?
15. A mile is about 1609 meters. Which is longer, a mile or a kilometer?
16. How many millimeters equal one meter?
17. **Estimate** This key is about
- how many inches long?
  - how many centimeters long?
  - how many millimeters long?



18. **Estimate** This rectangle is
- how many centimeters long?
  - how many centimeters wide?



19. If an ant started at one corner of the rectangle above and crawled along all four sides back to the starting point, how many centimeters would it crawl?

The distance around a shape is its **perimeter**. To find the perimeter of a shape, we add the lengths of all of its sides.

In problem **18**, we found the perimeter of the rectangle by adding the length, the width, the length, and the width. Here we show a formula for the perimeter of a rectangle:

Perimeter of rectangle = length + width + length + width

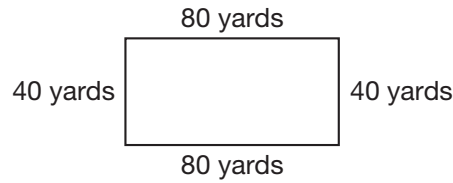
If we use the letter  $P$  for perimeter,  $l$  for length, and  $w$  for width, the formula becomes:

$$P = l + w + l + w$$

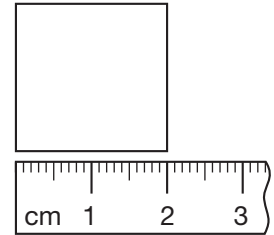
Since there are two lengths and two widths, we often write the formula this way:

$$P = 2l + 2w$$

20. Keisha ran the perimeter of the block below. How far did Keisha run?

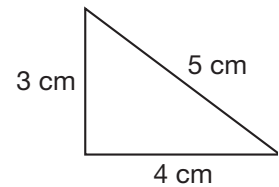


21. What is the perimeter of this square?



22. What is the perimeter of a square with sides 10 in. long?

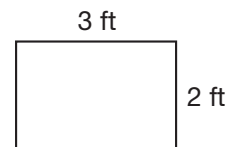
23. Find the perimeter of the triangle at right:



24. a. What is the length of the rectangle at right?

- b. What is the width of the rectangle?

- c. What is the perimeter of the rectangle?



25. **Analyze** Uncle Beau's cows graze in a grassy field surrounded by a wire fence. Which represents the perimeter of the field: the grassy field or the wire fence?

26. **Analyze** A glass mirror on Amanda's wall is surrounded by a wooden frame. Which represents the perimeter of the mirror: the glass mirror or the wooden frame?

27. **Estimate** What is the perimeter of your classroom in meters? Make an estimate by taking one-meter steps along the edges of the classroom.

28. **Explain** What is the meaning of this formula?

$$P = 2l + 2w$$



## Activity

### Estimating the Perimeter

Material needed:

- ruler or yardstick

Use an inch ruler or a yardstick to estimate the perimeter of several items in your classroom.

Items might include:

- your desktop
- your teacher's desktop
- a door
- a book cover
- the classroom board

Make a list of the items you choose and the estimated perimeter for each item.



Describe the relationship between the two sets of data in this table:

Perimeters of Squares

Perimeter (in inches)	4	8	12	16	20	24
Side length (in inches)	1	2	3	4	5	6

**Predict** What is the perimeter of a square with a side length of 10 inches? How do you know?

**Generalize** Write a formula that could be used to find the perimeter of any square.