Contents

Skills Update

A handbook for reviewing essential
and previously taught skills

Introduction to Problem Solving

Algebra Lesson promotes algebraic reasoning.

*Develops concept or skill with manipulatives.　　*Algebra* Lesson promotes algebraic reasoning.

★ Develops concept or skill with manipulatives.   *Algebra* Lesson promotes algebraic reasoning.

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$\frac{1}{8}$ $\frac{1}{4}$

$\frac{1}{5}$ **1** $\frac{1}{3}$

*Develops concept or skill with manipulatives.   *Algebra* Lesson promotes algebraic reasoning.

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★ Develops concept or skill with manipulatives.   *Algebra* Lesson promotes algebraic reasoning.

Skills Update

A Review of Mathematical Skills from Grade 3

Progress in Mathematics includes a "handbook" of essential skills, Skills Update, at the beginning of the text. These one-page lessons review skills you learned in previous years. It is important for you to know this content so that you can succeed in math this year.

If you need to review a concept in Skills Update, your teacher can work with you using manipulatives, which will help you understand the concept better.

The Skills Update handbook can be used throughout the year to review skills you may already know. Since many lessons in your textbook refer to pages in the Skills Update, you can use a particular lesson at the beginning of class as a warm-up activity. Or your class may choose to do the Skills Update lessons at the beginning of the year so that you and your teacher can assess your understanding of these previously learned skills.

You may even want to practice specific skills at home. If you need more practice than what is provided on the Skills Update page, you can use the practice pages available online at www.sadlier-oxford.com. These practice pages have an abundance of exercises for each one-page lesson.

Hundreds

3 hundreds   2 tens   6 ones
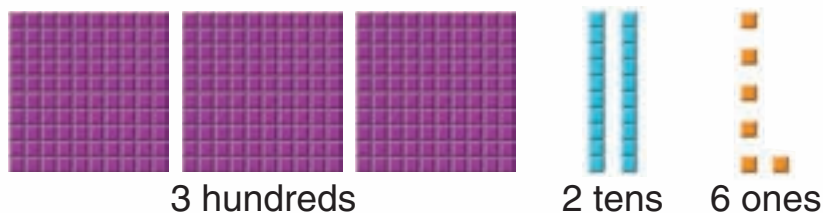
Standard Form: 326
Word Name: three hundred twenty-six

HUNDREDS	TENS	ONES
3	2	6

The digit 6 is in the *ones place*.
It has a value of 6 ones, or 6.

The digit 2 is in the *tens place*.
It has a value of 2 tens, or 20.

The digit 3 is in the *hundreds place*.
It has a value of 3 hundreds, or 300.

Write the number in standard form.

1.
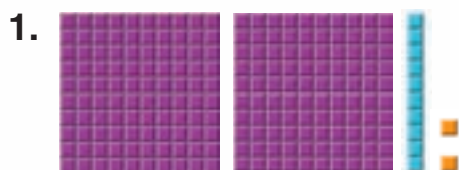
2.

HUNDREDS	TENS	ONES
6	0	7

3. 1 hundred 8 tens 3 ones

4. five hundred sixty-two

Write the place of the red digit. Then write its value.

5. 482   **6.** 369   **7.** 141   **8.** 965   **9.** 174   **10.** 218

11. 522   **12.** 697   **13.** 742   **14.** 831   **15.** 420   **16.** 505

Numeration I

Compare Whole Numbers

> \> means "is greater than"　　　　< means "is less than"
> = means "is equal to"

To compare numbers:

- Align the digits
  by place value.

  6453
  6459 ↓

- Start at the left. Compare
  the digits in the greatest place.

  6453
  6459

  6 = 6

- If these digits are the same,
  compare the next digits.

  6453
  6459

  4 = 4

- Keep comparing digits until
  you find two digits that
  are *not* the same.

  6453
  6459

  5 = 5
  9 > 3

So 6459 > 6453. You could also say 6453 < 6459.

Study this example.

423 _?_ 2423

423
2423 ↓

.Think.................
There are no
thousands in 423.

0 < 2　　　So 423 < 2423　　**or**　　2423 > 423.

Compare. Write <, =, or >.

1. 57 = 57　　　　**2.** 65 _?_ 62　　　　**3.** 48 _?_ 56　　　　**4.** 82 _?_ 28

5. 325 _?_ 523　　**6.** 649 _?_ 841　　**7.** 127 _?_ 134　　**8.** 525 _?_ 522

9. 6241 _?_ 9246　　**10.** 7983 _?_ 7983　　**11.** 9015 _?_ 9012

12. 2704 _?_ 2714　　**13.** 8619 _?_ 8617　　**14.** 1844 _?_ 1846

Numeration II

Recognize and Count Money

ten-dollar bill $10.00	five-dollar bill $5.00	one-dollar bill $1.00

half-dollar 50¢ or $.50	quarter 25¢ or $.25	dime 10¢ or $.10	nickel 5¢ or $.05	penny 1¢ or $.01

To count bills and coins, arrange in order from greatest to least value. Then count on.

$10.00 + $5.00 + $.25 + $.10 + $.01

$10.00 ⟶ $15.00 ⟶ $15.25 ⟶ $15.35 ⟶ $15.36

Write each amount. Use the dollar sign and decimal point.

1.

2.

3. 1 five-dollar bill, 3 quarters, 1 dime, 3 nickels, 2 pennies

4. 4 dollars, 1 quarter, 2 nickels

Addition and Subtraction Facts

► Add: $5 + 4 = $?

▲ ▲ ▲ ▲ ▲
▲ ▲ ▲ ▲
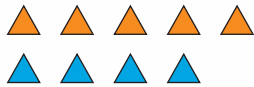
$$\begin{array}{r} 5 \\ +4 \\ \hline 9 \end{array}$$ ← addends ← sum

or

$$5 + 4 = 9$$
addends   sum

► Subtract: $11 - 5 = $?

☐ ☐ ☐ ☐ ☐
☐ ▨ ▨ ▨ ▨
▨
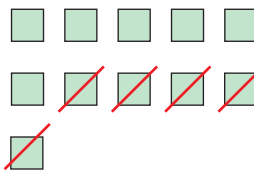
$$\begin{array}{r} 11 \\ -5 \\ \hline 6 \end{array}$$ ← difference

or

$$11 - 5 = 6$$
difference

> **Remember:**
> $5 + 4 = 9$ is a number sentence for addition.
> $11 - 5 = 6$ is a number sentence for subtraction.

Add or subtract. Watch the signs.

1. $\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$
2. $\begin{array}{r} 4 \\ +9 \\ \hline \end{array}$
3. $\begin{array}{r} 16 \\ -9 \\ \hline \end{array}$
4. $\begin{array}{r} 6 \\ +5 \\ \hline \end{array}$
5. $\begin{array}{r} 14¢ \\ -7¢ \\ \hline \end{array}$
6. $\begin{array}{r} 12¢ \\ -4¢ \\ \hline \end{array}$

7. $\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$
8. $\begin{array}{r} 16 \\ -7 \\ \hline \end{array}$
9. $\begin{array}{r} 0 \\ +7 \\ \hline \end{array}$
10. $\begin{array}{r} 13 \\ -4 \\ \hline \end{array}$
11. $\begin{array}{r} 7¢ \\ +9¢ \\ \hline \end{array}$
12. $\begin{array}{r} 14¢ \\ -6¢ \\ \hline \end{array}$

13. $\begin{array}{r} 15 \\ -8 \\ \hline \end{array}$
14. $\begin{array}{r} 9 \\ +9 \\ \hline \end{array}$
15. $\begin{array}{r} 11 \\ -8 \\ \hline \end{array}$
16. $\begin{array}{r} 9 \\ +6 \\ \hline \end{array}$
17. $\begin{array}{r} 18¢ \\ -9¢ \\ \hline \end{array}$
18. $\begin{array}{r} 8¢ \\ +6¢ \\ \hline \end{array}$

19. $17 - 8$ **20.** $6 + 6$ **21.** $15 - 7$ **22.** $6¢ + 7¢$ **23.** $3¢ + 8¢$

Whole Number Operations I

Algebra
Related Facts

These four facts are <mark>related facts</mark>.
They all use the same numbers.

$6 + 5 = 11$ $\qquad$ $11 - 5 = 6$

$5 + 6 = 11$ $\qquad$ $11 - 6 = 5$

Study these examples.

$12 = 4 + 8$
$12 = 8 + 4$
$8 = 12 - 4$
$4 = 12 - 8$

$3 + 3 = 6$
$6 - 3 = 3$

Write the related facts for each pair.

1.

4, 6

2.

2, 7

3.

3, 9

4.

5, 8

5.

4, 5

6.

3, 7
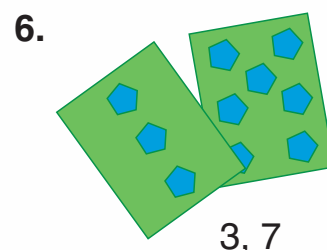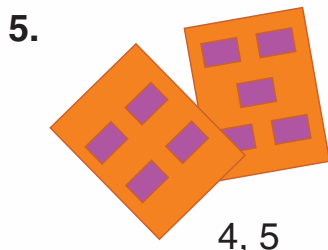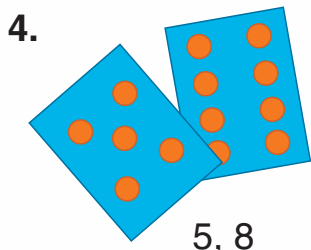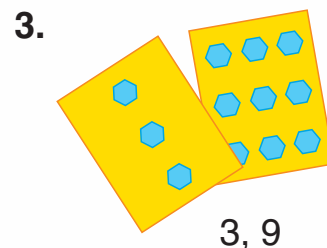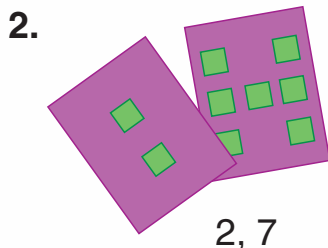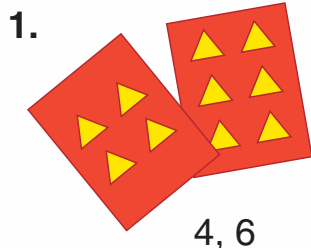
7. 9, 5 $\qquad$ **8.** 2, 5 $\qquad$ **9.** 8, 8 $\qquad$ **10.** 6, 7

Complete each addition or subtraction fact.

11. $\underline{\ ?\ } + 7 = 13$
$\quad 7 + \underline{\ ?\ } = 13$
$\quad 13 - 7 = \underline{\ ?\ }$
$\quad 13 - \underline{\ ?\ } = 7$

12. $\underline{\ ?\ } + 9 = 17$
$\quad 9 + \underline{\ ?\ } = 17$
$\quad 17 - \underline{\ ?\ } = 9$
$\quad 17 - 9 = \underline{\ ?\ }$

13. $15 = \underline{\ ?\ } + 8$
$\quad 15 = 8 + \underline{\ ?\ }$
$\quad 8 = 15 - \underline{\ ?\ }$
$\quad \underline{\ ?\ } = 15 - 8$

Add and Subtract without Regrouping

Add: 2110 + 3022 = __?__

Align. Add. Start with the ones.

Add ones.	Add tens.	Add hundreds.	Add thousands.
2110	2110	2110	2110
+ 3022	+ 3022	+ 3022	+ 3022
2	32	132	5132

Subtract: 5867 − 4536 = __?__

Align. Subtract. Start with the ones.

Subtract ones.	Subtract tens.	Subtract hundreds.	Subtract thousands.
5867	5867	5867	5867
− 4536	− 4536	− 4536	− 4536
1	31	331	1331

Find the sum.

1. 42	**2.** 128	**3.** 173	**4.** 8317	**5.** 8117	**6.** 6416
+ 33	+ 820	+ 13	+ 1222	+ 782	+ 2103

7. 15 + 22 + 50 + 11   **8.** 23 + 11 + 34 + 21   **9.** 300 + 240 + 159

Find the difference.

10. 53	**11.** 279	**12.** 8576	**13.** 878	**14.** 6495	**15.** 5986
− 21	− 151	− 1423	− 843	− 3122	− 5082

16. 67 − 5   **17.** 175 − 25   **18.** 438 − 16

Whole Number Operations III

Meaning of Multiplication

▶ To find how many, you can add
3 groups of 7: $7 + 7 + 7 = 21$

3 groups of 7
3 sevens
3×7

Since you are joining equal groups, you can **multiply**:

number of groups	$\times$	number in each group	=	total number
3	$\times$	7	=	21

or

$$7 \longleftarrow \text{factor}$$
$$\underline{\times\ 3} \longleftarrow \text{factor}$$
$$21 \longleftarrow \text{product}$$
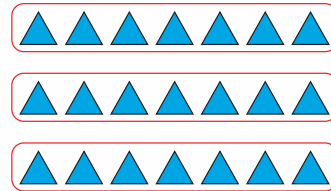
Remember: $3 \times 7 = 21$ is a **multiplication sentence**.

▶ Add: $2¢ + 2¢ + 2¢ + 2¢ = 8¢$

Or multiply: $4 \times 2¢ = \underline{\ ?\ }$

$$\begin{array}{r} 2¢ \\ \underline{\times 4} \\ 8¢ \end{array} \quad \text{or}$$

$4 \times 2¢ = 8¢$
factors   product

4 groups of 2¢
4 twos
$4 \times 2¢$

Write an addition sentence and a multiplication sentence for each.

1.

2.

3.
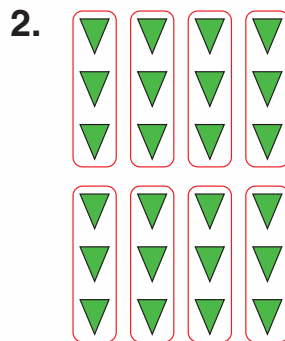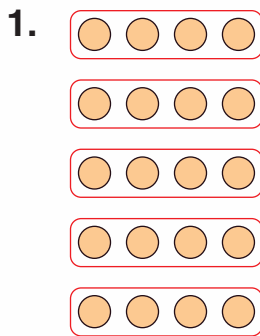
Multiplication Facts

Add:

$9 + 9 + 9 + 9 + 9 = 45$

Or multiply:

$$\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array} \quad \text{or} \quad 5 \times 9 = 45$$
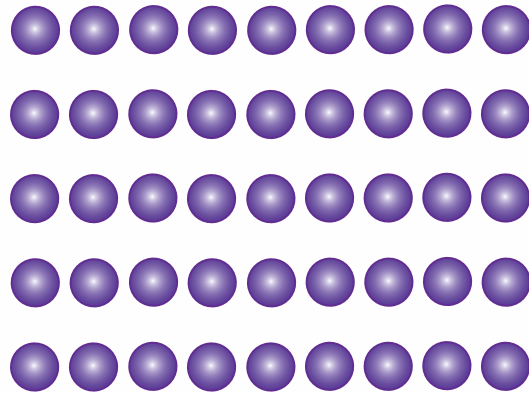
5 groups of 9
5 nines
5×9

Find the product.

1. $\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$	**2.** $\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$	**3.** $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$	**4.** $\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$	**5.** $\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array}$	**6.** $\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$
7. $\begin{array}{r} 2¢ \\ \times 5 \\ \hline \end{array}$	**8.** $\begin{array}{r} 8¢ \\ \times 3 \\ \hline \end{array}$	**9.** $\begin{array}{r} 9¢ \\ \times 2 \\ \hline \end{array}$	**10.** $\begin{array}{r} 5¢ \\ \times 4 \\ \hline \end{array}$	**11.** $\begin{array}{r} 7¢ \\ \times 3 \\ \hline \end{array}$	**12.** $\begin{array}{r} 8¢ \\ \times 5 \\ \hline \end{array}$
13. $\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$	**14.** $\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$	**15.** $\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$	**16.** $\begin{array}{r} 8 \\ \times 9 \\ \hline \end{array}$	**17.** $\begin{array}{r} 7¢ \\ \times 6 \\ \hline \end{array}$	**18.** $\begin{array}{r} 4¢ \\ \times 9 \\ \hline \end{array}$

19. 4×6 **20.** 3×4 **21.** $5 \times 6¢$ **22.** $4 \times 4¢$

23. 9×5 **24.** 7×9 **25.** $7 \times 4¢$ **26.** $9 \times 3¢$

Problem Solving Write a multiplication sentence for each.

27. One factor is 4. The product is 24. What is the other factor?

28. There are 9 mugs. On each mug, students paint 7 flowers and 5 trees. How many flowers are painted in all?

29. The factors are 3 and 7. What is the product?

Whole Number Operations V

Multiply with 10, 11, and 12

Multiply: $3 \times 11 = \underline{\ ?\ }$

$$\begin{array}{r} 11 \\ \times 3 \\ \hline 33 \end{array}$$
  or $3 \times 11 = 33$
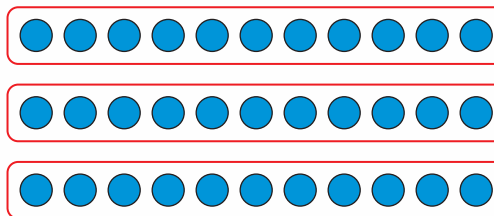
3 groups of 11
3 elevens
3×11

Multiply.

1. $\begin{array}{r} 11 \\ \times\ 6 \\ \hline \end{array}$	**2.** $\begin{array}{r} 10 \\ \times\ 5 \\ \hline \end{array}$	**3.** $\begin{array}{r} 12 \\ \times\ 7 \\ \hline \end{array}$	**4.** $\begin{array}{r} 12 \\ \times\ 4 \\ \hline \end{array}$	**5.** $\begin{array}{r} 10¢ \\ \times\ 9 \\ \hline \end{array}$	**6.** $\begin{array}{r} 12¢ \\ \times\ 5 \\ \hline \end{array}$
7. $\begin{array}{r} 11 \\ \times\ 2 \\ \hline \end{array}$	**8.** $\begin{array}{r} 12 \\ \times\ 3 \\ \hline \end{array}$	**9.** $\begin{array}{r} 12 \\ \times\ 8 \\ \hline \end{array}$	**10.** $\begin{array}{r} 10 \\ \times\ 6 \\ \hline \end{array}$	**11.** $\begin{array}{r} 11¢ \\ \times\ 8 \\ \hline \end{array}$	**12.** $\begin{array}{r} 10¢ \\ \times\ 7 \\ \hline \end{array}$
13. $\begin{array}{r} 11 \\ \times\ 4 \\ \hline \end{array}$	**14.** $\begin{array}{r} 12 \\ \times\ 2 \\ \hline \end{array}$	**15.** $\begin{array}{r} 10 \\ \times\ 4 \\ \hline \end{array}$	**16.** $\begin{array}{r} 11 \\ \times\ 9 \\ \hline \end{array}$	**17.** $\begin{array}{r} 12¢ \\ \times\ 6 \\ \hline \end{array}$	**18.** $\begin{array}{r} 10¢ \\ \times\ 8 \\ \hline \end{array}$

Find the product.

19. 7×12 **20.** 1×12 **21.** $1 \times 11¢$ **22.** $2 \times 10¢$

23. 9×12 **24.** 3×10 **25.** $7 \times 11¢$ **26.** $3 \times 11¢$

27. 1×10 **28.** 4×10 **29.** $8 \times 12¢$ **30.** $5 \times 11¢$

Problem Solving

31. Ms. Black made 11 paper triangles for each of 7 mobiles. How many paper triangles did Ms. Black make in all?

32. Dawn made 4 vests. On each vest she sewed 10 buttons and 12 stars. How many buttons did she sew?

Understand Division

Pablo packs 10 apples into baskets.
He puts 2 apples in each basket.
How many baskets does he pack?

▶ To find how many baskets,
separate 10 into equal groups of 2.
Use repeated subtraction.

Think
How many groups
of 2 are in 10?
Count back by 2s
until you reach 0.
8, 6, 4, 2, 0

$$-2 \quad -2 \quad -2 \quad -2 \quad -2$$

0 1 2 3 4 5 6 7 8 9 10
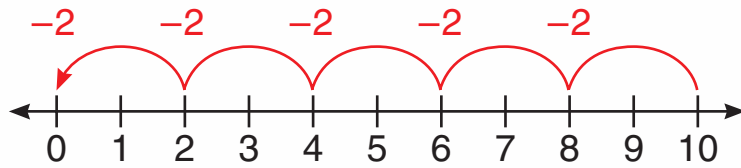
You subtracted 5 times.

Pablo packs 5 baskets.

▶ You can also write a division sentence to show how to
separate 10 into equal groups of 2.

Write: 10 ÷ 2 = 5 ← division sentence

| number in all | number in each group | number of groups |

Read as: "Ten divided by two equals five."

Find how many groups.

1. 16 in all
8 in each group

2. 9 in all
3 in each group

3. 20 in all
5 in each group

4. 14 in all
2 in each group

5. 18 in all
9 in each group

6. 15 in all
5 in each group

7. 36 in all
4 in each group

8. 12 in all
3 in each group

9. 10 in all
2 in each group

Whole Number Operations VII

Division Facts

▶ Divide: $35 \div 5 = \underline{\ ?\ }$

Think
$\underline{\ ?\ } \times 5 = 35$
$7 \times 5 = 35$

So $\underset{\uparrow}{35} \div \underset{\uparrow}{5} = \underset{\uparrow}{7}$.

dividend   divisor   quotient

or

$\text{divisor} \longrightarrow 5\overline{)35}$ $\overset{7 \ \longleftarrow \text{quotient}}{} \longleftarrow \text{dividend}$
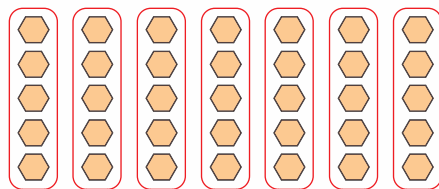
35 in all
5 in each group

Remember: $35 \div 5 = 7$
is a division sentence.

▶ Find the quotient: $27¢ \div 3 = \underline{\ ?\ }$

Think
$3 \times \underline{\ ?\ } = 27¢$
$3 \times 9¢ = 27¢$

So $27¢ \div 3 = 9¢$ or $3\overline{)27¢}$ with $9¢$ above.
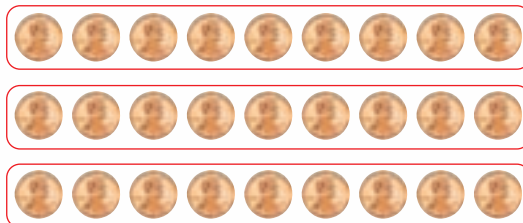
27¢ in all
3 equal groups

Find the quotient.

1. $2\overline{)0}$ (answer 0)   2. $4\overline{)24}$ 3. $5\overline{)40}$ 4. $3\overline{)15}$ 5. $2\overline{)18¢}$ 6. $5\overline{)5¢}$

7. $4\overline{)16}$ 8. $3\overline{)21}$ 9. $2\overline{)16}$ 10. $4\overline{)36}$ 11. $5\overline{)25¢}$ 12. $2\overline{)12¢}$

13. $6\overline{)6}$ 14. $7\overline{)28}$ 15. $6\overline{)54}$ 16. $8\overline{)48}$ 17. $9\overline{)63¢}$ 18. $9\overline{)72¢}$

19. $45 \div 9$ 20. $32 \div 8$ 21. $42 \div 6$ 22. $64 \div 8$ 23. $20 \div 5$

24. $3¢ \div 3$ 25. $14¢ \div 2$ 26. $28¢ \div 4$ 27. $30¢ \div 5$

28. $56¢ \div 7¢$ 29. $9¢ \div 9¢$ 30. $18¢ \div 6¢$ 31. $27¢ \div 9¢$

Relate Multiplication and Division

▶ **Multiply** when you join equal groups to find the total number.

3	×	6	=	18
number of groups		number in each group		total number
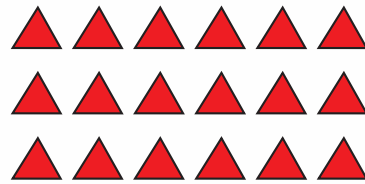
18 in all
6 in each group
3 equal groups

▶ **Divide** when you want to find:

• the number of equal groups.

18	÷	6	=	3
total number		number in each group		number of groups

• the number in each equal group.

18	÷	3	=	6
total number		number of groups		number in each group

▶ A **fact family** uses the same numbers. Use the facts to help you find related facts.

$4 \times 5 = 20$ $20 \div 5 = 4$
$5 \times 4 = 20$ $20 \div 4 = 5$
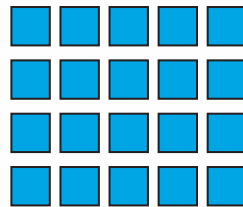
> These four facts make up a fact family for the numbers 4, 5, and 20.

Copy and complete each fact family.

1. $6 \times 5 = 30$
   $\underline{?} \times 6 = 30$
   $30 \div 5 = \underline{?}$
   $30 \div 6 = \underline{?}$

2. $9 \times 7 = 63$
   $\underline{?} \times 9 = 63$
   $63 \div 7 = \underline{?}$
   $63 \div 9 = \underline{?}$

3. $4 \times 4 = 16$
   $16 \div 4 = \underline{?}$

Write a fact family for each set of numbers.

4. 2, 4, 8
5. 3, 7, 21
6. 4, 3, 12
7. 5, 7, 35

8. 7, 6, 42
9. 9, 1, 9
10. 8, 3, 24
11. 3, 2, 6

12. 8, 7, 56
13. 9, 5, 45
14. 5, 8, 40
15. 6, 6, 36

Whole Number Operations IX

Identify Fractions

A fraction can name one or more *equal parts* of a whole or of a set.

▶ $\frac{1}{4}$ of the circle is shaded.

$\frac{3}{4}$ of the circle is *not* shaded.
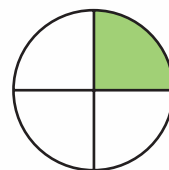
4 equal parts

▶ $\frac{3}{5}$ of the set of circles is shaded.

$\frac{2}{5}$ of the set of circles is *not* shaded.
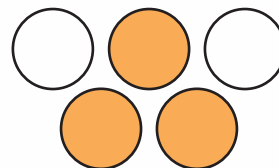
5 equal parts

Write the fraction for the shaded part of each whole or set. Then write the fraction for the part that is not shaded.

1.

2.

3.

4.

5.

6.

7.

8.
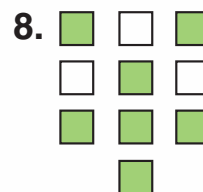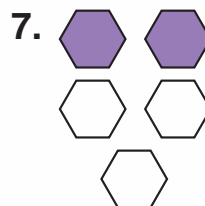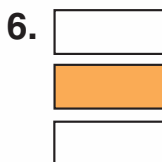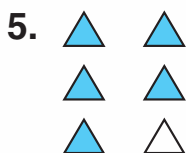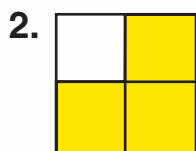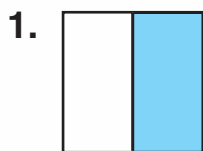
Write a fraction for the red part of each set. Then write a fraction for the yellow part.

9.

10.

11.

12.
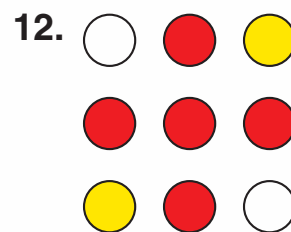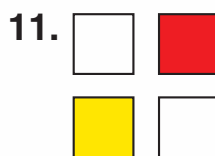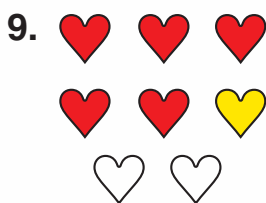
Customary Units of Length

The inch (in.) is a customary unit of length.

A quarter is about 1 inch wide. You can use a quarter as a benchmark for 1 inch.

A benchmark is an object of known measure that can be used to estimate the measure of other objects.

— 1 in. —
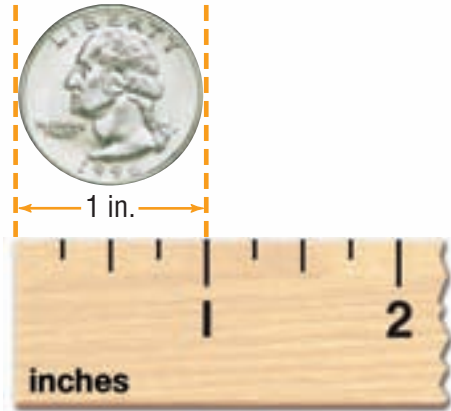
inches

The foot (ft) and the yard (yd) are also customary units of length.

12 inches (in.) = 1 foot (ft)
3 feet (ft) = 1 yard (yd)
36 inches (in.) = 1 yard (yd)

New Jersey
JAA·OJA
Garden State

1 ft

1 yd

A license plate is about 1 foot long.   A door is about 1 yard wide.

Write the letter of the best estimate.

1. length of a paintbrush   **a.** 9 ft   **b.** 9 yd   **c.** 9 in.

2. length of a bus   **a.** 40 in.   **b.** 40 ft   **c.** 40 yd

3. height of a wall   **a.** 3 in.   **b.** 3 yd   **c.** 3 ft

Measurement I

Cup, Pint, Quart, Gallon

The cup (c), the pint (pt), the quart (qt), and the gallon (gal) are customary units of liquid capacity.

2 cups = 1 pint
2 pints = 1 quart
2 quarts = 1 half gallon
4 quarts = 1 gallon

1 cup

1 pint

1 quart

1 half gallon

1 gallon

Write *c, pt, qt,* or *gal* for the unit you would use to measure the capacity of each.

1. swimming pool

2. cereal bowl

3. can of soup

4. can of house paint

5. tanker truck

6. small container of frozen yogurt

7. large glass of juice

8. bottle of seltzer

9. family-size jar of mayonnaise

10. car's tank of gasoline

Pound

The pound (lb) is a customary unit of weight.

Three bananas weigh about 1 pound.
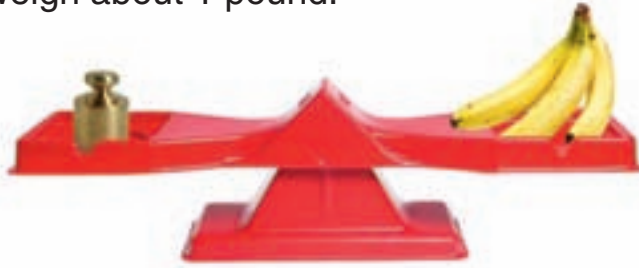
Weight is measured on a balance or a scale.

Does each actual object weigh more than 1 pound, less than 1 pound, or about 1 pound?

1.

2.

3.

4.

5.

6.

Centimeter and Meter

The centimeter (cm) and the meter (m) are metric units of length.

> 100 centimeters (cm) = 1 meter (m)

1 cm

A large paper clip is about 1 centimeter wide.

A full-size baseball bat is about 1 meter long.

Write the letter of the best estimate.

1. height of a mug   **a.** 2 cm   **b.** 9 cm   **c.** 2 m

2. width of a room   **a.** 4 m   **b.** 20 cm   **c.** 12 m

3. length of a soccer field   **a.** 10 m   **b.** 100 cm   **c.** 100 m

4. height of a cat   **a.** 99 cm   **b.** 1 m   **c.** 30 cm

5. length of a bed   **a.** 2 m   **b.** 20 cm   **c.** 20 m

Write *cm* or *m* for the unit you would use to measure each.

6. width of a dollar bill   **7.** height of a giraffe

Liter

The <mark>liter (L)</mark> is a metric unit of liquid capacity.

Springwater is sold in bottles that hold 1 L.

Does each actual object hold more than 1 liter, less than 1 liter, or about 1 liter?

1.

2.

3.

4.

5.

6.

7.

8.

9.

Measurement V

Kilogram

The kilogram (kg) is a metric unit of mass.

A small bag of flour has a mass of about 1 kilogram.

Mass is measured on a balance.

Does each actual object have a mass of more than 1 kilogram, less than 1 kilogram, or about 1 kilogram?

1.

2.
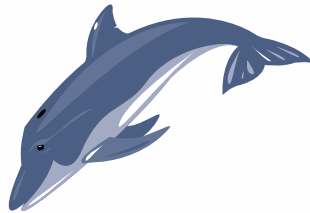
3.

4.

5.

6.

Perimeter

Find the perimeter of the figure below.

Perimeter is the distance around a figure.

To find the perimeter of a figure,
add the lengths of its sides.

$$\begin{array}{r} 100 \text{ ft} \\ 60 \text{ ft} \\ 75 \text{ ft} \\ + \ \ 50 \text{ ft} \\ \hline 285 \text{ ft} \end{array}$$

100 ft

50 ft

60 ft

75 ft
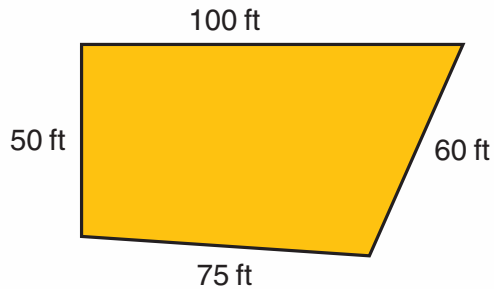
Find the perimeter of each figure.

1.

22 cm   24 cm

14 cm

2.

8 m
7 m   7 m
12 m   12 m
7 m   7 m
8 m

3.

60 yd
50 yd   50 yd
60 yd

4.

23 ft
42 ft   15 ft
30 ft

5.

4 m
4 m   3 m
     2 m
4 m

6.

9 ft   13 ft
9 ft
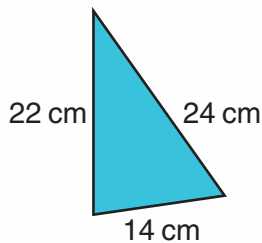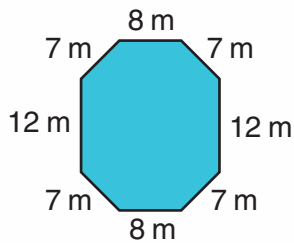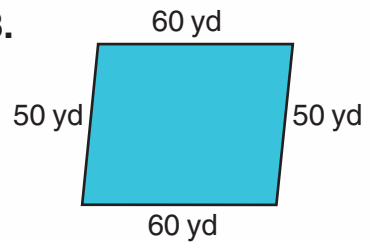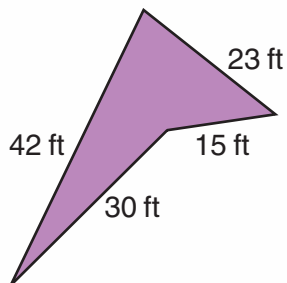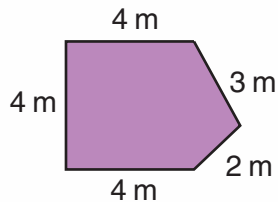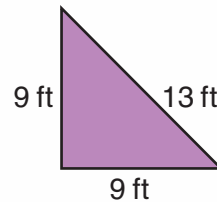
7. a polygon whose sides
measure 100 ft, 142 ft,
68 ft, and 127 ft

8. a polygon whose sides
measure 92 m, 109 m,
and 92 m

Geometry I

Congruent Figures

Each of the patterns below was made
using congruent figures.
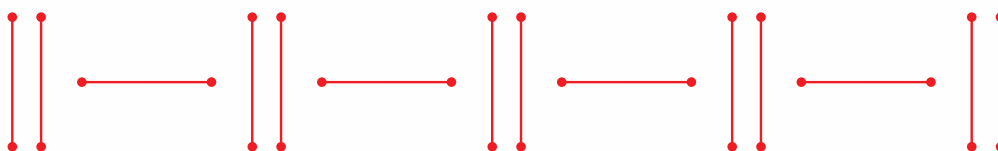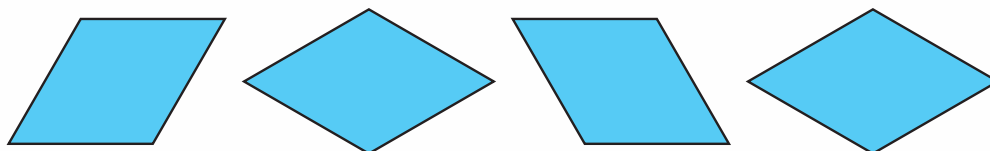
Congruent figures have exactly
the same size and the same shape.

To find whether two figures are congruent:

- Carefully trace one figure onto tracing paper.
- Lay the tracing over the other figure.

If the tracing and the figure match,
the two figures are congruent.

Are the figures congruent? Write *yes* or *no.*
You may use tracing paper.

1.

2.

3.

Geometry II
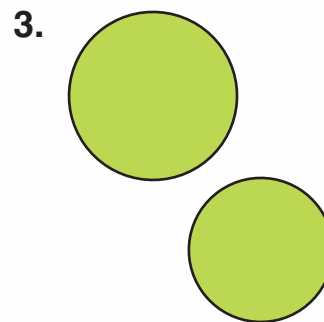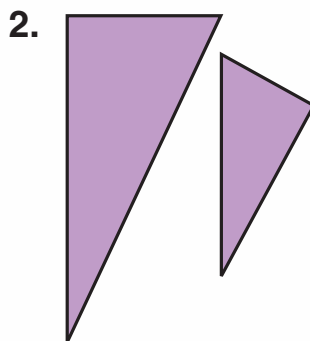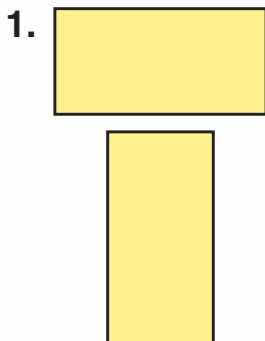
Lines of Symmetry

If you can fold a figure in half so that the two halves exactly match, the figure is symmetrical.

The fold line is a line of symmetry.
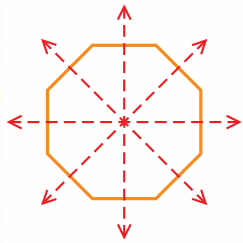
4 lines of symmetry
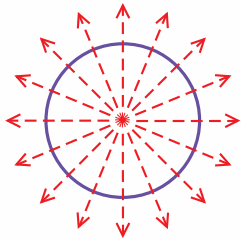
A circle has more lines of symmetry than you can count.

You can also use a reflection to see if the two halves exactly match.

Is each red line a line of symmetry? Write *yes* or *no*.

1.

2.

3.

4.

5.

6.

7.

8.

Geometry III
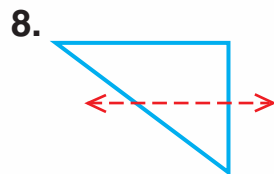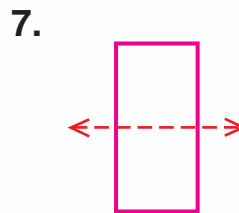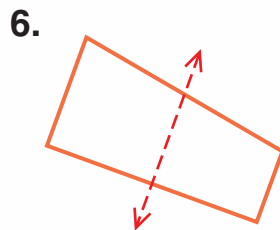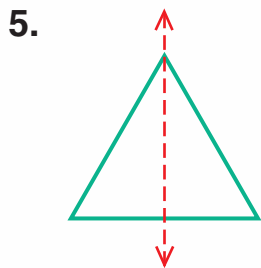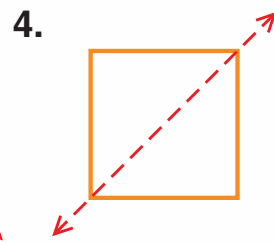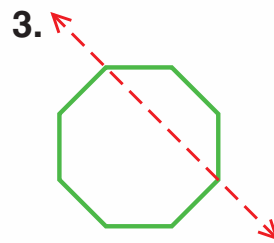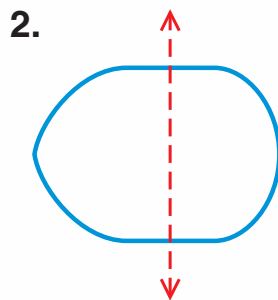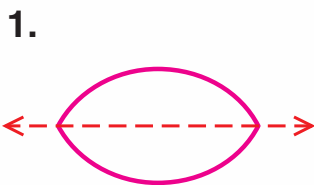
Algebra
Ordered Pairs on a Grid

Ordered pairs locate points on a grid.

▶ Look at the grid. What figure is at point (4,3)?

To find out:

- Begin at 0.

- The first number tells you to move 4 spaces to the right.

- The second number tells you to move 3 spaces up.
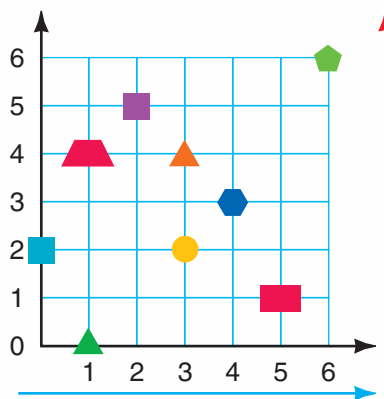
The hexagon is located at point (4,3)

▶ Locate the rectangle. Name the ordered pair for that point.

The rectangle is located at point (5,1)

The rectangle is 5 spaces to the *right* and 1 space *up.*

Use the grid for exercises 1–24.
Write the letter for each ordered pair.

1. (2,3)	**2.** (3,4)	**3.** (6,4)
4. (0,6)	**5.** (4,2)	**6.** (1,4)
7. (1,1)	**8.** (5,3)	**9.** (3,5)
10. (0,0)	**11.** (4,1)	**12.** (5,5)
13. (6,0)	**14.** (0,3)	**15.** (4,6)

Write the ordered pair for each letter.

16. *K*	**17.** *I*	**18.** *M*
19. *U*	**20.** *T*	**21.** *G*
22. *O*	**23.** *X*	**24.** *Q*
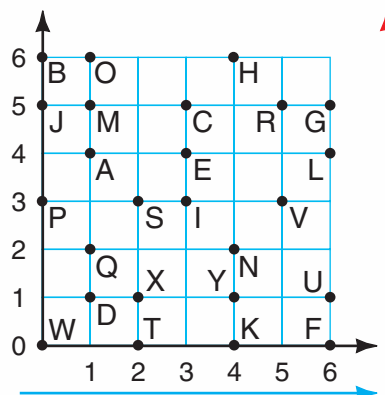
Area

Area is the number of square units
needed to cover a flat surface.

1 square unit

► You can find the area of some figures
by counting squares.
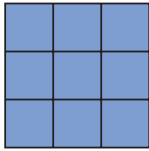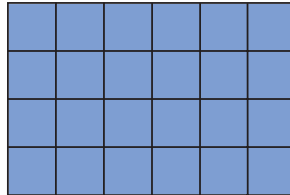
9 square units   24 square units   17 square units
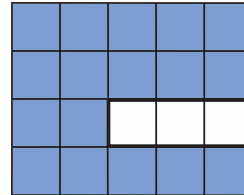
► Sometimes you need to count half squares
to find the area of a figure.
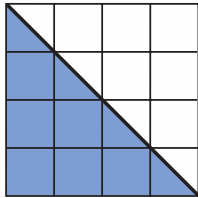
6 whole squares + 4 half squares
6 + 2 = 8
8 square units

.Think......................
4 half squares =
2 whole squares

Find the area of each figure.

1.

2.

3.

4.

5.

6.

Geometry V
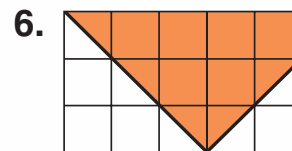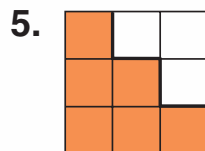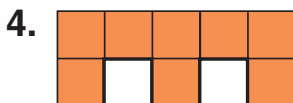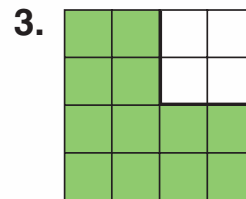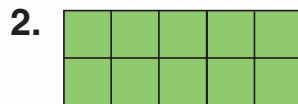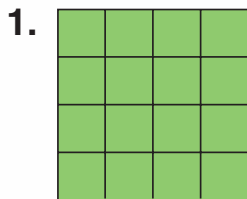
Record and Organize Data

▶ The tally chart at the right shows how many birds of different kinds came to a bird feeder one day.

Remember:
| = 1 and ⟋⟋⟋⟋ = 5

Kind of Bird	Tally
House Sparrow	⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ II
House Finch	⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋
Blue Jay	⟋⟋⟋⟋ ⟋⟋⟋⟋ III
Chickadee	⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ I
Nuthatch	IIII
Junco	⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ III

Which kind of bird visited the feeder most often? least often?

▶ Organizing information in a table from least to greatest or greatest to least makes it easier to find and compare data.

House sparrows visited the feeder most often. Nuthatches visited least often.

Birds at My Feeder

Kind	Number
House Sparrow	32
House Finch	25
Junco	23
Chickadee	16
Blue Jay	13
Nuthatch	4

The table and tally chart below show the number of farm animals Alex and Rachel saw on a trip.

Complete the table and tally chart.

Animal	Number
1. Cows	?
2. Pigs	11
3. Goats	?
4. Horses	?
5. Sheep	26
6. Chickens	?

Animal	Tally
Cows	⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ II
Pigs	
Goats	⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ III
Horses	⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ I
Sheep	
Chickens	⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ ⟋⟋⟋⟋ III

Problem Solving Use the table and the tally chart from exercises 1–6.

7. Make another table with the data organized from least to greatest.

8. What kind of animal was seen most often? least often?

Statistics I

Graphing Sense

Video Sales in May			
Cartoon			
Comedy			
Drama			
Key: Each ▮ = 100 videos.			
Each ▯ = 50 videos.			
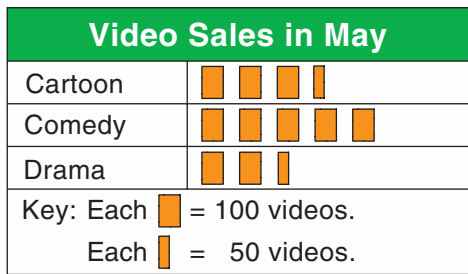
A **pictograph** uses pictures or symbols to represent data. The **Key** tells how many each symbol stands for.

TV Viewing Per Week
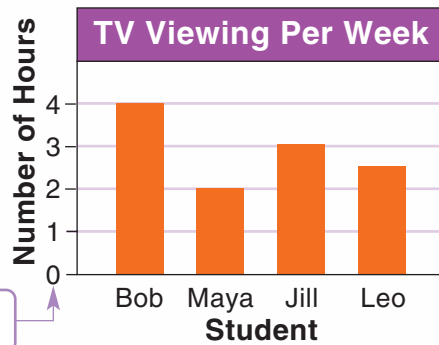
scale

A **bar graph** uses bars to represent data. The **scale** tells how much or how many each bar stands for.

Vic's TV Sales
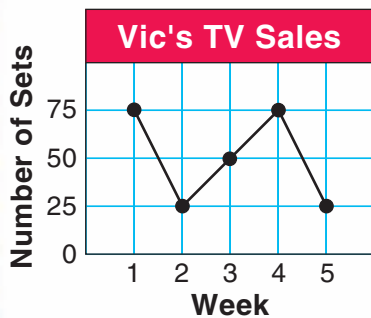
A **line graph** uses points and lines on a grid to show change over a period of time. A line graph also has a scale.

TV Favorites of Ms. Lee's Class

Movies ► 6
Nature ► 8
10 ◄ Cartoons
14 ◄ Comedies
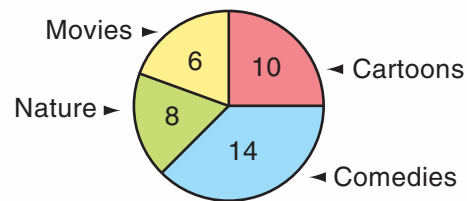
A **circle graph** uses sections of a circle to compare the parts of a whole.

Choose the graph you would use in each case. Explain why.

1. Compare at a glance the number of books each of your friends reads in a month.

2. Show how the temperature changed during the course of a week.

3. See how the number of classmates who like the beach compares to the total number of classmates.

Statistics II

Probability Experiments

Karim flips a quarter 10 times. Because the quarter has two sides, Karim predicts that it will land heads up half the time and tails up half the time. This is 5 times each.

As he flips the quarter, Karim tallies the results.

Heads	ⅢⅡ II	7
Tails	III	3

Heads   Tails

Sometimes experiments do not come out as you predict they will. This often happens when you do the experiment a small number of times.

Try these experiments. You may work with a partner.

1. Suppose you flip a coin 10 times. Predict how many times it will land heads up and how many times it will land tails up. Flip it 10 times and tally the results. How close is the result to your prediction?

   Now predict how many times the coin will land heads up and tails up if you flip it 20 times. Flip the coin and tally the results. Compare your tally with a classmate's. Describe how your tallies are alike and how they are different.

2. Put 2 red cubes and 1 yellow cube into a paper bag. If you pick a cube without looking, what color do you think the cube you pick will be? Was your prediction correct?

   Suppose you pick 6 times without looking and put the cube back into the bag after each pick. Predict how many times you would pick a red cube and how many times you would pick a yellow cube. Try the experiment. How close are the results to your predictions?

Introduction to
Problem Solving

Dear Student,

Problem solvers are super sleuths. We invite you to become a super sleuth by using these four steps when solving problems.

1 Read **2 Plan** **3 Solve** **4 Check**

Sleuths use clues to find a solution to a problem. When working together to solve a problem, you may choose to use one or more of these strategies as clues:

Strategy File

Use These Strategies
Combine Strategies
Make a Table or List
Interpret the Remainder
Write a Number Sentence
Write an Equation
More Than One Solution

Strategy File

Use These Strategies
Use a Diagram/Graph
Work Backward
Logical Reasoning
Use More Than One Step

Strategy File

Use These Strategies
Choose the Operation
Find a Pattern
Use a Drawing or Model
Guess and Test
More Than One Way
Use Simpler Numbers

Read ▶ **Create a mental picture.**
List the facts and the questions.

As you read a problem, create a picture in your mind. Make believe you are there in the problem. This will help you think about:
- what facts you will need;
- what the problem is asking;
- how you will solve the problem.

After reading the problem, it might be helpful to sketch the picture you imagined so that you can refer to it.

Name or list all the facts given in the problem. Be aware of *extra* information not needed. Look for *hidden* information. Name the question or questions the problem asks.

Plan ▶ **Choose and outline a plan.**

Plan how to solve the problem by:
- looking at the picture you drew;
- thinking about how you solved similar problems;
- choosing a strategy or strategies for solving the problem.

Solve ▶ **Work the plan.**

Work with the listed facts and the strategy to find the solution. Sometimes a problem will require you to add, subtract, multiply, or divide. Multistep problems require more than one choice of operation or strategy. It is good to *estimate* the answer before you compute.

Check ▶ **Test that the solution is reasonable.**

Ask yourself:
- "Have you answered the question?"
- "Is the answer reasonable?"

Check the answer by comparing it to the estimate. If the answer is not reasonable, check your computation.

Strategy: Choose the Operation

Number Sentence	Definition
□ + □ = □	Join like groups or quantities.
□ − □ = □	Separate, or take away, from a group. Compare two groups or quantities. Find part of a group. Find how many more are needed.
□ × □ = □	Join only equal groups or quantities.
□ ÷ □ = □	Separate into equal groups. Share a group equally.

Meg collects comic books. She puts 7 comic books into each envelope. How many envelopes does she need for 42 comic books?

Read ▶ **Visualize yourself in the problem as you reread it. Focus on the facts and questions.**

Facts: 7 comic books in each envelope
42 comic books

Question: How many envelopes does she need?

Plan ▶ You are separating into equal groups.
Divide: $42 \div 7 = \underline{\ ?\ }$

Think
$\underline{\ ?\ } \times 7 = 42$

Solve ▶ $42 \div 7 = 6$
Meg needs 6 envelopes.

Check ▶ Multiply to check division:
$6 \times 7 = 42$

Algebra
Strategy: Guess and Test

Pat's bank holds dimes and quarters. There are 4 more dimes than quarters in the bank. The value of all the coins is $2.85. How many quarters are in Pat's bank?
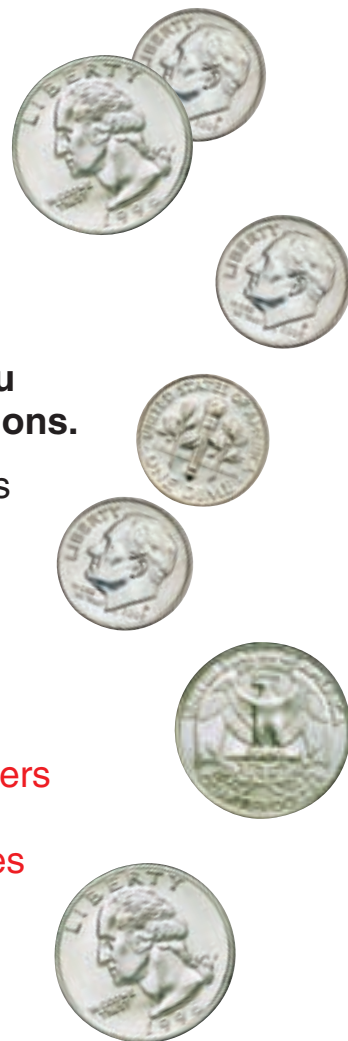
Read **Visualize yourself in the problem as you reread it. Focus on the facts and questions.**

Facts: bank holds dimes and quarters
4 more dimes than quarters
$2.85 in quarters and dimes

Question: How many quarters are in Pat's bank?

Plan First **guess** a number of quarters. 5 quarters

Add 4 to find the number of dimes. 9 dimes

Then **test** to find whether the value of the coins equals $2.85.

Make a table to record your guesses.

Solve

		Quarter Value	Dime Value	Total Value	Test
Guesses	1st	5 quarters = $1.25	9 dimes = $ .90	$1.25 + $ .90 = $2.15	too low
	2nd	6 quarters = $1.50	10 dimes = $1.00	$1.50 + $1.00 = $2.50	too low
	3rd	7 quarters = $1.75	11 dimes = $1.10	$1.75 + $1.10 = $2.85	correct

Check The third guess is correct because:

- 11 dimes is 4 coins more than 7 quarters.

- 7 quarters ($1.75) and 11 dimes ($1.10) equal $2.85.

Algebra
Strategy: Use More Than One Step

Tina, Maya, and Olga need to collect 200 aluminum cans to win a recycling contest. Tina has collected 57 cans, Maya has collected 76 cans, and Olga has collected 64 cans. How many more cans do the girls still need to collect?

Read ▶ **Visualize yourself in the problem as you reread it. Focus on the facts and questions.**

Facts: 200 cans needed.
Tina collected 57 cans.
Maya collected 76 cans.
Olga collected 64 cans.

Question: How many more cans are still needed?

Plan ▶ First find the number of cans collected. Add.

57	+	76	+	64	=	?
Tina's cans		Maya's cans		Olga's cans		number collected

Then find the number of cans the girls still need to collect. Subtract the sum from 200.

200	−	?	=	?
in all		number collected		number still needed

Solve ▶ 57 + 76 + 64 = 197
The girls collected 197 cans.

200 − 197 = 3
The girls need to collect 3 more cans.

Check ▶ Use addition to check your answer.

197	+	3	=	200
cans collected		cans still needed		cans in all

Algebra
Strategy: Write a Number Sentence

A nursery donates 36 trees to a city.
The city plants 4 trees in each of its parks.
At most, how many parks could there be?

Read > **Visualize yourself in the problem as you reread it. Focus on the facts and questions.**

Facts: 36 trees donated
4 trees in each park

Question: How many parks could there be?

Plan > Because the 36 trees are being separated into equal groups of 4 trees each, write a number sentence for division.

$36 \div 4 = \underline{?}$ parks

> **Think**
> Number ÷ Number = Number
> in all   in each   of groups
>   group

Solve > Divide to find the quotient.

$$\begin{array}{r} 9 \\ 4\overline{)36} \\ -36 \\ \hline 0 \end{array}$$

> **Think**
> How many 4s are in 36? 9

There could be 9 parks.

Check > Multiply the quotient by the divisor.

$$\begin{array}{r} 9 \\ \times\ 4 \\ \hline 36 \end{array}$$

The answer checks!

Applications: Mixed Review

Choose a strategy from the list or use another strategy you know to solve each problem.

1. Olivia works at a zoo gift shop. She sold 6 small, 8 medium, and 4 large T-shirts. How many T-shirts did she sell?

2. Olivia sold 16 posters. Penguins were pictured on 7 of the posters. Pandas were on the rest. How many panda posters did Olivia sell?

3. Stu packed 6 ceramic animals into each small box. How many boxes does he need for 54 ceramic animals?

4. Ryan sent 22 animal buttons to three cousins. Sue received twice as many buttons as Mike and 3 more than Jill. How many buttons did each receive?

5. Lin wants to use 7 animal beads for each of 9 necklaces he is making for the zoo gift shop. How many animal beads will he need?

Strategy File

Use These Strategies
Choose the Operation
Guess and Test
Write a Number Sentence
Use More Than One Step

Use the table for problem 6.

6. Max pays the sale price for 3 key chains, 1 toucan shirt, and 2 fish cards. How much money did he save?

Sale at the Zoo Shop		
Item	Regular Price	Sale Price
Polar Bear Key Chain	$3	$2
Toucan Shirt	$12	$10
Fish Cards	$8	$4

Place Value

In this chapter you will:

Explore one million

Compare, order, and round whole
numbers and money

Locate numbers on a number line

Make change

Read and write numbers through
the one billions place

Solve problems by making a table
or list

Critical Thinking/Finding Together

There are 10 hundreds in 1000.
How many hundred miles are in a
twenty-six-thousand mile trip?

Willis C. Sick

There once was a young man on a ship
Who counted each pitch and each dip,
    Each roll and each yaw,
    Each sea and each saw
On a twenty-six-thousand mile trip.

John Ciardi

1-1

Thousands

A place-value chart makes understanding large numbers easier.

In 206,493 the value of:
- 2 is 2 hundred thousands or 200,000.
- 0 is 0 ten thousands or 0.
- 6 is 6 thousands or 6000.
- 4 is 4 hundreds or 400.
- 9 is 9 tens or 90.
- 3 is 3 ones or 3.

> In numbers larger than 9999, use a comma to separate the periods.

Standard Form: 206,493

Word Name: two hundred six thousand, four hundred ninety-three

> Each group of 3 digits is called a period.

THOUSANDS PERIOD			ONES PERIOD		
HUNDREDS	TENS	ONES	HUNDREDS	TENS	ONES
2	0	6	4	9	3
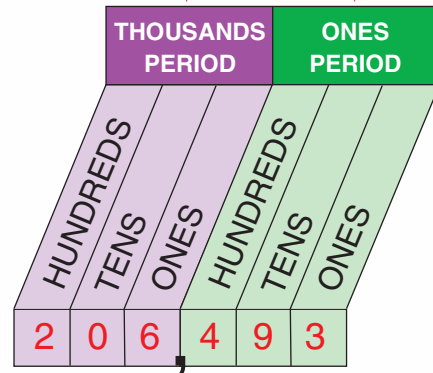
> Four-digit numbers may be written with or without a comma.

Practice

Write the place of the red digit. Then write its value.

1. 6,541

2. 7,843

3. 3,962

4. 5,034

5. 27,142

6. 46,359

7. 65,186

8. 92,170

9. 156,143

10. 983,567

11. 495,638

12. 374,826

13. 632,018

14. 275,941

15. 321,235

16. 176,404

17. 205,866

18. 652,048

19. 520,124

20. 804,397

Write the number in standard form.

21. nine hundred four

22. twelve thousand

23. six hundred thousand

24. eight thousand

25. five hundred twenty-one thousand, one hundred twelve

26. sixty-four thousand, seven hundred thirty-five

27. two hundred forty thousand, three hundred ninety-two

28. ninety thousand, four hundred eight

29. one hundred fifteen thousand, five hundred sixty

30. three hundred thousand, two

31. four hundred one thousand, eighteen

32. fifty-four thousand, sixty-eight
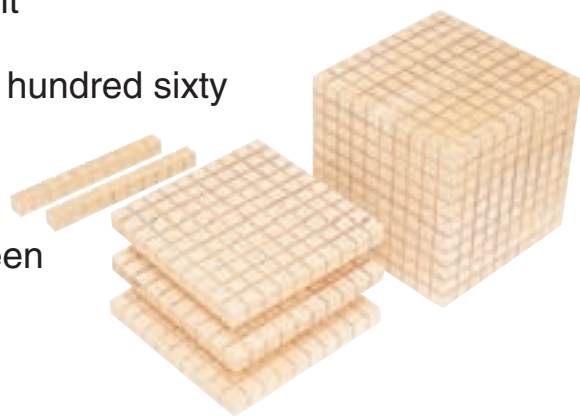
Write the word name for each number.

33. 762	**34.** 431	**35.** 605	**36.** 911
37. 4,918	**38.** 1,265	**39.** 7,016	**40.** 3,402
41. 25,461	**42.** 51,824	**43.** 90,160	**44.** 80,007
45. 169,818	**46.** 748,295	**47.** 300,040	**48.** 809,006

CRITICAL THINKING

49. What are the least and the greatest four-digit numbers you can make using all the digits in each set only once?

a. 1, 2, 3, 4   **b.** 0, 3, 2, 1   **c.** 1, 0, 0, 2

What Is One Million?

The numbers from 1 to 999 are in the ones period. The numbers from 1000 to 999,999 are in the thousands period. Today you will discover the next counting number.

Materials: paper, pencil

Compute the rest of exercise 1. Record each number sentence and the answer.

1. $10 \times 1 = 10$
   $10 \times 10 = 100$
   $10 \times 100 = 1000$
   $10 \times 1000 = \underline{?}$
   $10 \times 10,000 = \underline{?}$
   $10 \times 100,000 = \underline{?}$

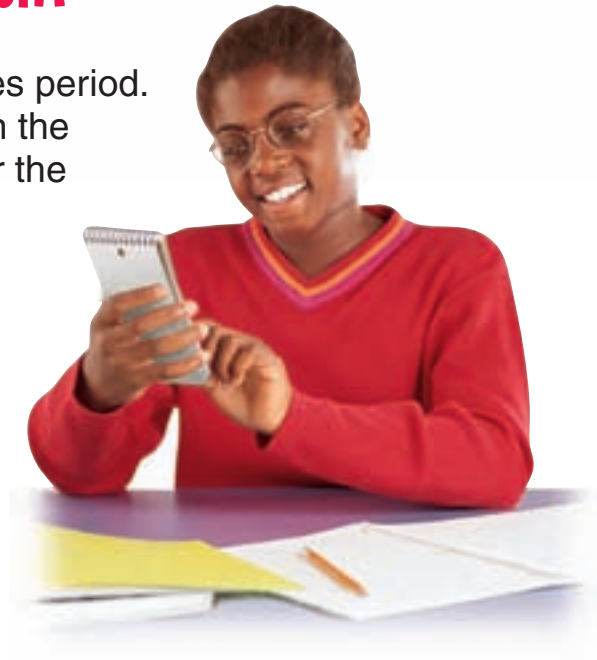2. What patterns do you notice?

The number that is $10 \times 100,000$ is *one million*, or 1,000,000.
One million is the next counting number after 999,999.

3. How is 1,000,000 like 1000; 10,000; and 100,000? How is it different?

$1,000,000 = 10$ hundred thousands
$1,000,000 = 100$ ten thousands

4. How many thousands is one million equal to? how many hundreds?

Suppose you counted one number per second.
You would take about

- <u>?</u> to count to 100.

- $16\frac{1}{2}$ minutes to count to 1000.

- 2 hours and 42 minutes to count to 10,000.

- 1 day to count to 100,000.

- $11\frac{1}{2}$ days to count to 1,000,000!
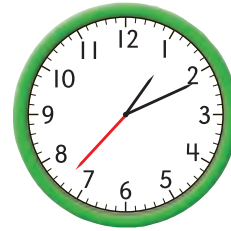
You may make a table to find the answers
to questions 5–7. Explain your answers.

5. If you were 100 days old, would you be older
or younger than 1 year old?

6. About how many years old would you be if you
were 1000 days old? 10,000 days old?
(*Hint:* 1 year = 365 days)

7. About how many years old would you be if you
were 100,000 days old? 1,000,000 days old?

Communicate

8. How did you discover how old you would be if
you were 100 days old?

9. How did you discover how old you would be if
you were 1000; 10,000; 100,000; and
1,000,000 days old?

CHALLENGE

10. If you were to continue the
pattern from exercise 1 on
page 38, what would the
next three entries be?

11. Rewrite the last entry from
exercise 10. Which zero do you
think is in the millions place?
Underline it.

Millions

Recently, the population of Brazil was 184,101,109.

In the <mark>millions period</mark> of 184,101,109, the value of:
1 is 1 hundred million, or 100,000,000.
8 is 8 ten millions, or 80,000,000.
4 is 4 millions, or 4,000,000.

MILLIONS PERIOD			THOUSANDS PERIOD			ONES PERIOD		
HUNDREDS	TENS	ONES	HUNDREDS	TENS	ONES	HUNDREDS	TENS	ONES
1	8	4	1	0	1	1	0	9

Standard Form: 184,101,109

Word Name: one hundred eighty-four million,

one hundred one thousand,

one hundred nine

Practice

Write the period of the underlined digits.

1. <u>45</u>,678

2. 59,<u>650</u>

3. <u>26</u>,545

4. <u>456</u>,789

5. 567,<u>890</u>

6. <u>148</u>,337

7. <u>9</u>,456,789

8. 567,<u>890</u>,000

9. <u>617</u>,148,337

Write in standard form.

10. thirty-one million

11. three million

12. six hundred million

13. eighty million

14. one hundred twenty million

15. fifty-two million

Write the place of the red digit.
Then write its value.

16. 482,165,016

17. 904,628,153

18. 617,465,089

19. 38,296,145

20. 10,692,534

21. 4,797,123

22. 412,076,531

23. 217,945,310

24. 842,005,301

25. 920,354,876

26. 105,643,129

27. 732,530,481

28. 334,091,685

29. 2,444,656

30. 778,322

Write the word name for each number.

31. 5,460,000

32. 920,015,300

33. 10,300,000

34. 475,000

35. 1,006,005

36. 20,000,012

37. 7,002,502

38. 408,000,201

39. 87,005

Write About It

Brazil is the largest country in South America.

40. The land area of Brazil is three million, two hundred eighty-six thousand, four hundred seventy square miles. How would you write this number in standard form?

41. In Brazil there are two million, one hundred thirty-five thousand, six hundred thirty-seven square miles of forest. Write this number in standard form.

42. The Brazilian city of Rio de Janeiro has an estimated population of 5,974,100. Write this number in words.

Brazil