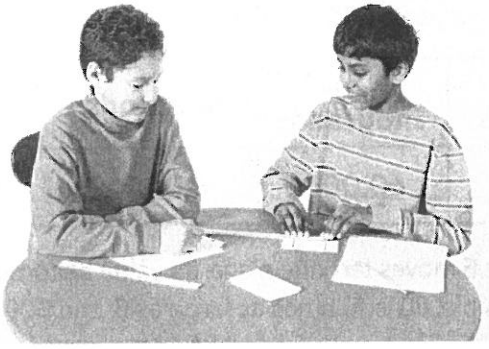
Home Link 1-1

NAME DATE TIME

Introduction to *Fourth Grade Everyday Mathematics*

Welcome to *Fourth Grade Everyday Mathematics*, part of an elementary school mathematics curriculum developed by the University of Chicago School Mathematics Project (UCSMP).



Fourth Grade Everyday Mathematics emphasizes the following content:

Operations and Algebraic Thinking Investigating methods for solving problems involving mathematics in everyday situations; solving multistep problems involving the four operations; using estimation to check the reasonableness of answers; exploring properties of numbers such as multiples, factor pairs, prime and composite; and designing, exploring, and using geometric and number patterns.

Numbers and Operations in Base Ten Reading, writing, comparing, and ordering whole numbers; exploring addition, subtraction, multiplication, and division methods; inventing individual procedures and methods.

Number and Operations—Fractions Developing an understanding of fraction equivalence; exploring addition and subtraction of fractions with like denominators and multiplication of fractions by whole numbers; and reading, writing, comparing, and ordering fractions and decimals.

Measurement and Data Exploring metric and U.S. customary measurement systems and converting from larger units to smaller units within a single system; applying formulas to find the perimeters and areas of rectangles; developing an understanding of angles and angle measurement; and representing and interpreting data on line plots.

Geometry Drawing and identifying geometric properties and identifying these properties in polygons; recognizing and drawing a line of symmetry; identifying symmetric figures.

Everyday Mathematics provides you with many opportunities to monitor your child's progress and participate in your child's experience of mathematics. Throughout the year you will receive Family Letters to keep you informed of the mathematical content your child will be studying in each unit. Each letter includes a vocabulary list, suggested Do-Anytime Activities for you and your child, and an answer guide to selected Home Link (homework) activities. You will enjoy seeing your child's confidence and comprehension soar as he or she connects mathematics to everyday life.

This unit reviews and extends mathematical content developed in *Third Grade Everyday Mathematics*. In Unit 1, students will explore the following concepts:

Place Value in Whole Numbers Students review place-value concepts and explore numbers in the ten-thousands and hundred-thousands. They will read, write, compare, and order these numbers. Students will also use population data from U.S. cities to practice rounding and comparison techniques.

Computation Students practice mental and paper-and-pencil methods of computation, as well as using a calculator. They will decide which tool is most appropriate for solving a particular problem.

Students explore a new strategy for adding and subtracting multidigit whole numbers and compare different methods. They will realize that often the same result may be obtained in multiple ways.

Students use estimation to assess the reasonableness of answers as they work with multistep number stories using a letter for the unknown.

Measurement and Data Students review the concept of perimeter and then develop and apply formulas for finding the perimeters of rectangles.

Students convert between customary units of length (yards, feet, inches) and solve number stories involving conversions.

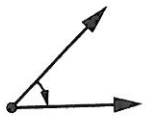
Geometry Students examine definitions and properties of 2-dimensional shapes and the relationships among them.

Please keep this Family Letter for reference as your child works through Unit 1.

Vocabulary

Important terms in Unit 1:

acute angle An angle with a measure greater than 0° and less than 90°.



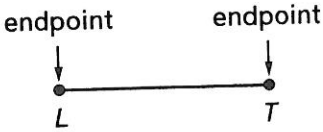
acute angle

angle A figure that is formed by two rays or two line segments with a common endpoint.

base 10 Our number system in which each place in a number has a value 10 times as large as the place to its right and $\frac{1}{10}$ the place to its left.

digit One of the number symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 in the standard base-10 system.

endpoint A point at the end of a line segment or ray.



line segment *LT*

expanded form A way of writing a number as the sum of the values of each digit. For example, the expanded form of 356 is 300 + 50 + 6.

intersect To share a common point or points.

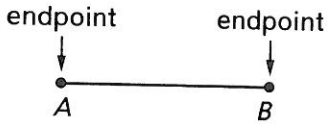
intersecting lines and segments

intersecting planes

line A straight path that extends infinitely in opposite directions.

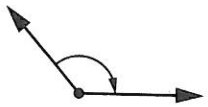
line *PR*

line segment A straight path joining two points, which are called endpoints.



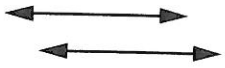
line segment *AB*

obtuse angle An angle that has a measure greater than 90° and less than 180°.



obtuse angle

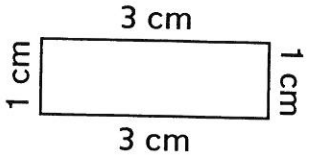
parallel Lines, line segments, or rays in the same plane are parallel if they never cross or meet, no matter how far they are extended in either direction.



parallel lines

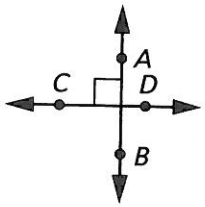
parallelogram A quadrilateral that has two pairs of parallel sides. Opposite sides of a parallelogram have equal lengths, and its opposite angles have the same measure.

perimeter The distance around the boundary of a 2-dimensional figure.



perimeter = 1 cm + 3 cm + 1 cm + 3 cm = 8 cm

perpendicular Crossing or meeting at right angles. Lines, rays, or line segments that cross or meet at right angles are perpendicular.

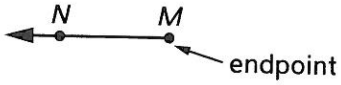


perpendicular lines

place value The value given to a digit according to its position, or place, in a number. The chart on the next page shows the value of each digit in 24,815.

point An exact location in space. Lines have an infinite number of points on them.

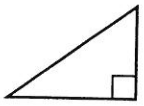
ray A straight path that extends infinitely from an endpoint. A ray is named using the letter label of its endpoint followed by the letter label of another point on the ray.



ray *MN*

right angle An angle that measures exactly 90°.

right triangle A triangle that contains a right angle.

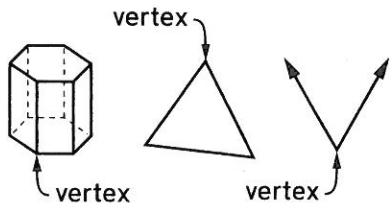


right triangle

U.S. traditional addition A paper-and-pencil method for adding multidigit numbers in which the addends are stacked vertically with place values aligned and the digits in each column are added, working column by column from the right. The tens digit, if any, from a column sum is "carried" to the top of the next column to the left and is added with the digits in that column.

U.S. traditional subtraction A paper-and-pencil method for subtracting multidigit numbers. The minuend (number from which another is subtracted) and subtrahend (number being subtracted) are stacked vertically with place values aligned and the digits in each column are subtracted, working column by column from the right. If a digit in the subtrahend is larger than the corresponding digit in the minuend, a 10 is "borrowed" from the next column to the left.

vertex A point at which the rays of an angle or the sides of a geometric figure meet.



whole numbers The numbers 0, 1, 2, 3, 4, and so on.

Ten-Thousands	Thousands	Hundreds	Tens	Ones
2	4	8	1	5
The value of the 2 is 20,000.	The value of the 4 is 4,000.	The value of the 8 is 800.	The value of the 1 is 10.	The value of the 5 is 5.

Place-value chart

Do-Anytime Activities

To work with your child on concepts taught in this unit, try these activities:

1. Have your child locate big numbers in newspapers and other sources and ask him or her to read them to you. Or read the numbers and have your child write them down.
2. Help your child look up the populations and land areas of the state and city in which you live and compare them with the populations and areas of other states and cities.
3. Together, write five multidigit numbers in order from smallest to largest.
4. Model real-life uses of estimation for your child. For example, when you are shopping, round the cost of several items up to the nearest dollar and add to estimate their total cost.
5. Help your child discover everyday uses of geometry found in art, architecture, jewelry, toys, and so on.

Building Skills through Games

Throughout the school year, students will play mathematics games as a way to practice a variety of arithmetic skills. Playing games turns practice into a fun thinking activity. Games in this unit provide practice with place value, addition, and subtraction. They require very few materials, so you and your child can play them at home.

***Addition Top-It* (Advanced Version)** See *Student Reference Book*, page 275. This variation of *Addition Top-It* provides practice adding numbers through the thousands.

Fishing for Digits See *Student Reference Book*, page 259. This game provides practice identifying digits and their values, as well as adding and subtracting.

Number Top-It See *Student Reference Book*, page 269. This game provides practice working with place value through the hundred-thousands.

***Subtraction Top-It* (Advanced Version)** See *Student Reference Book*, page 275. This variation of *Subtraction Top-It* provides practice subtracting numbers through the thousands.

As You Help Your Child with Homework

As your child brings assignments home, you may want to go over the instructions together, clarifying them as necessary. The answers listed below will guide you through the Home Links for this unit.

Home Link 1-1

1. **a.** 800 **b.** 6,000 **c.** 70,000 **d.** 100,000
3. 10; 10; 10
4. 67,538 ; Sixty-seven thousand, five hundred thirty-eight

Home Link 1-2

3a. Uganda. Both have the same number of ten-thousands, but Uganda's area has 3 thousands and Laos's area has 1 thousand.

3b. 93,100 > 91,400

Home Link 1-3

1. Chicago Sky: 18,000
   Connecticut Sun: 10,000
   Indiana Fever: 18,000
   Los Angeles Sparks: 13,000
   Minnesota Lynx: 19,000
   Phoenix Mercury: 18,000
   Seattle Storm: 17,000
   Tulsa Shock: 18,000
   Washington Mystics: 20,000
3. Wyoming: 600,000
   Vermont: 600,000
   North Dakota: 700,000
   Alaska: 700,000
   South Dakota: 800,000

Home Link 1-4

1. Baseball
3. 3,000,000; 4,000,000; 4,000,000; 3,000,000; 2,000,000
5. 2,370,794 < 3,565,718

Home Link 1-5

1. **a.** No. Sample answer: I rounded the times to the tens place and added: $20 + 40 = 60$ and $60 + 20 = 80$.

   b. Sample answer: The numbers were all close to a multiple of 10. I just needed to know if they added up to more or less than 60.

2. **a.** No. Sample answer: I used close-but-easier numbers. I rounded 31 to 30 and 24 to 25. $30 + 25 = 55$; $100 - 55 = 45$.

   b. Sample answer: The numbers were all close to friendly numbers, so I decided to go with close-but-easier numbers.

Home Link 1-6

Estimates vary.

1. 150 pounds; 144 pounds; Sample answer: $700 - (176 + 250 + 130) = 144$; Yes. Sample answer: My estimate was 150 pounds, which is close to my answer.
2. 300 pounds; 272 pounds; Sample answer: $(491 - (175 + 180)) * 2 = 272$; Yes; Sample answer: My estimate was 300 pounds, which is close to 272 pounds.

Home Link 1-7

Estimates vary.

1. 82; $40 + 50 = 90$ **3.** 1,673; $800 + 900 = 1{,}700$
5. 2,074; $300 + 1{,}800 = 2{,}100$ **7.** 2,800; 3,000

Home Link 1-8

1. 100 balls
2. 730 balls; Sample answer: 7 * 100 balls in a carton + 3 * 10 balls in a box = 730 balls
3. Sample answer: The number of cartons is like the digit in the 100s place, and the number of boxes is like the digit in the 10s place.

Home Link 1-9

Estimates vary.

1. 47; $90 - 40 = 50$ **3.** 319; $500 - 200 = 300$
5. 795; $2{,}000 - 1{,}000 = 1{,}000$ **7.** 1,034

Home Link 1-10

1. 12; 72; 96; 144 **3.** 27 feet
5. Four thousand, eight hundred fifty-seven

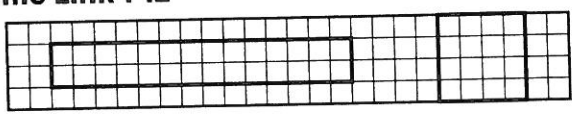
Home Link 1-11

3. **a.** 

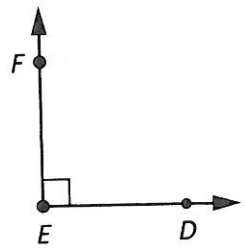
   b. No. A ray's endpoint must be listed first when naming a ray.

4. $\overline{WX}$ (or $\overline{XW}$) is parallel to $\overline{ST}$ (or $\overline{TS}$).

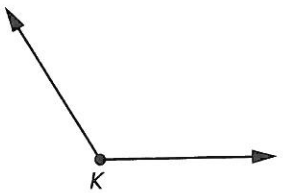
Home Link 1-12

1. 

3. Both have right angles and perpendicular sides. They have a different number of sides and right angles.

4. **a.** 

   b. E **c.** $\angle FED$

5. 

Home Link 1-13

1. 30 feet **2.** 42 inches **3.** 116 feet
4. 108 inches **5.** 6 feet
7. 900,000; 900,000

Place Value in Whole Numbers

Home Link 1-1

NAME DATE TIME

Family Note In this lesson your child explored the relationships between place values in numbers. Have your child read each number below. Examine the digit 6 in each number.

Hundred-Thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
600,000	60,000	6,000	600	60	6

When the digit 6 moves left one place, its value becomes 10 times as large as it was in the previous place. For example, 60 is 10 times as large as 6, and 600 is 10 times as large as 60.

SRB 78-79

① **a.** The 8 in 203,810 is worth _____. **b.** The 6 in 56,143 is worth _____.

c. The 7 in 573,090 is worth _____. **d.** The 1 in 140,007 is worth _____.

② How does the value of the digit 4 in 489 differ from the value of the digit 4 in 5,741?

_____

_____

③ **a.** The value of 8 in 56,982 is _____ times as large as the value of 8 in 156,408.

b. The value of 8 in 800 is _____ times as large as the value of 8 in 80.

c. The value of 9 in 4,934 is _____ times as large as the value of 9 in 1,290.

④ **a.** Write the number that has . . .

7 in the thousands place
6 in the ten-thousands place
5 in the hundreds place
8 in the ones place
3 in the tens place

_____ _____, _____ _____ _____

b. On the back of this page, write this number in words.

Practice

⑤ 9 + 8 = _____ ⑥ 7 + 8 = _____ ⑦ 30 + 80 = _____

⑧ _____ = 50 + 40 ⑨ _____ = 17 + 94 ⑩ 158 + 93 = _____

Country Sizes

Home Link 1-2

NAME DATE TIME

This table shows the sizes of 10 countries measured in square miles.

Country	Area (in square miles)
Algeria	919,600
Colombia	439,700
Ethiopia	426,400
Egypt	386,700
Greece	50,900
Iran	636,400
Laos	91,400
Peru	494,200
Uganda	93,100

Source: worldatlas.com (All data rounded to nearest hundred.)

Use a place-value tool to help you answer the questions.

(1) Read the numbers to someone at home.

(2) Which is the largest country listed?

_____

The smallest? _____

(3) Compare the areas of Laos and Uganda.

a. Which country has the larger area? _____ How do you know?

_____

_____

b. Write a comparison number sentence. _____

(4) Order the countries from largest area to smallest area.

Country	Area (in square miles)

Practice

(5) 140 − 60 = _____ (6) _____ = 57 − 39 (7) 115 − 86 = _____

Rounding

Home Link 1-3

NAME DATE TIME

SRB 85-87

(1) Round the seating capacities in the table below to the nearest thousand.

Women's National Basketball Association (WNBA) Seating Capacity of Home Courts		
Team	**Seating Capacity**	**Rounded to the Nearest 1,000**
Chicago Sky	17,500	
Connecticut Sun	9,518	
Indiana Fever	18,165	
Los Angeles Sparks	13,141	
Minnesota Lynx	19,356	
Phoenix Mercury	18,422	
Seattle Storm	17,072	
Tulsa Shock	17,839	
Washington Mystics	20,308	

Source: www.wnba.com

(2) Look at your rounded numbers. Which teams' arenas have about the same capacity?

_____

(3) Round the population figures in the table below to the nearest hundred-thousand.

U.S. States with the Five Smallest Populations (2010 Census)		
State	**Population**	**Rounded to the Nearest 100,000**
Wyoming	563,626	
Vermont	626,011	
North Dakota	699,628	
Alaska	731,449	
South Dakota	833,354	

Practice

(4) _____ = 60 + 60 (5) _____ = 54 + 59 (6) 185 + 366 = _____

Professional Sports Attendance

Home Link 1-4

NAME DATE TIME

The table below shows the attendance for various 2013–2014 professional sports teams. Use the table and a place-value tool to answer the questions.

SRB 81, 85-87

	Chicago*	New York*†	Philadelphia	Boston	Washington
Hockey	927,545	738,246	813,411	720,165	740,240
Baseball	2,882,756	3,542,406	3,565,718	3,043,003	2,370,794

Source: ESPN NHL Attendance report 2013–2014 and ESPN MLB Attendance report 2012
*Baseball attendance is for the Chicago Cubs and the New York Yankees.
†Hockey attendance is for the New York Rangers.

(1) Which sport had the greater attendance? _____

(2) Round the attendance at the hockey games.

	Nearest 100,000	Nearest 10,000
Chicago		
New York		
Philadelphia		
Boston		
Washington		

(3) Round the attendance for each baseball team to the nearest million.

Chicago: _____ New York: _____

Philadelphia: _____ Boston: _____

Washington: _____

(4) List the cities in order from greatest to least hockey attendance.

_____

(5) Write a number sentence comparing the greatest and least baseball attendances. Use <, >, or =.

_____

Practice

(6) 210 − 150 = _____ (7) 140 − 80 = _____ (8) 93 − 58 = _____

Using Estimation Strategies

Home Link 1-5

NAME DATE TIME

Family Note Today students explored different ways of estimating: **rounding** (in which all numbers are rounded to a particular place value), **front-end estimation** (all digits to the right of the greatest place value become zeros), and using **close-but-easier numbers** (numbers are rounded to a number that is close in value and easy to work with). While all methods of estimation are equally valid, some may be more helpful than others for answering specific kinds of questions.

Read the number stories. Choose an appropriate estimation strategy.

SRB 82-89

(1) On the walk home from school, Meg stopped at the library for 22 minutes and at her grandmother's house for 38 minutes. She spent 17 minutes walking. She left at 3:00 and was supposed to be home by 4:00.

a. Did Meg make it home on time? _____ How did you get your answer?

_____

_____

b. Why did you choose your estimation strategy? _____

_____

_____

(2) You and two friends need to make 100 tacos for a party. You have made 31 tacos. Your friend Chris has made 24 tacos. Your friend Pat thinks he needs to make at least 60 tacos to have enough for the party.

a. Is Pat correct? _____ How did you get your answer?

_____

_____

b. Why did you choose your estimation strategy? _____

_____

_____

Practice

(3) 31 + 51 = _____ (4) 45 + 64 = _____ (5) 252 + 144 = _____

Animal Number Stories

Home Link 1-6

NAME DATE TIME

SRB 82-84

Estimate. Then solve each number story.

(1) The zoo needs to move four animals in a truck that can carry only 700 pounds. A leopard can weigh up to 176 pounds. A warthog can weigh up to 250 pounds. A chimpanzee can weigh as much as 130 pounds. What is the maximum weight that the fourth animal can be?

Estimate: About _____ pounds

Answer: _____ pounds

Number model with answer: _____

Does your answer make sense? _____ How do you know?

_____

_____

(2) The combined weight of a mountain lion, an orangutan, and a wolf can be as much as 491 pounds. If the wolf weighs 175 pounds and the orangutan weighs 180 pounds, how much do ***two*** mountain lions weigh?

Estimate: About _____ pounds

Answer: _____ pounds

Number model with answer: _____

Does your answer make sense? _____ How do you know?

_____

_____

Source: maximum animal weights from www.nationalgeographic.com

Practice

(3) 5 + 8 = _____ (4) 9 + 6 = _____ (5) 70 + 50 = _____

(6) _____ = 80 + 50 (7) 67 + 94 = _____ (8) _____ = 425 + 275

U.S. Traditional Addition

Home Link 1-7

NAME DATE TIME

SRB 92-93

Family Note In today's lesson students were introduced to U.S. traditional addition. The steps are listed below.

Step 1

Add the 1s: 9 + 7 = 16.

16 ones = 1 ten and 6 ones

Write 6 in the 1s place below the line.

Write 1 above the digits in the 10s place.

$$\begin{array}{r} {\scriptstyle 1} \\ 79 \\ +47 \\ \hline 6 \end{array}$$

Step 2

Add the 10s: 7 + 4 + 1 = 12.

12 tens = 1 hundred + 2 tens

Write 2 in the 10s place below the line.

Write 1 in the 100s place below the line.

$$\begin{array}{r} {\scriptstyle 1} \\ 79 \\ +47 \\ \hline 126 \end{array}$$

Make an estimate. Write a number model to show what you did. Then solve using U.S. traditional addition. Compare your answer with your estimate to see if your answer makes sense.

① $\begin{array}{r} 36 \\ +46 \\ \hline \end{array}$ Estimate: _____	② $\begin{array}{r} 47 \\ +95 \\ \hline \end{array}$ Estimate: _____	③ 784 + 889 = Estimate: _____
④ $\begin{array}{r} 689 \\ +839 \\ \hline \end{array}$ Estimate: _____	⑤ 279 + 1,795 = Estimate: _____	⑥ 3,746 + 6,255 = Estimate: _____

Practice

⑦ Round 2,787 to the nearest . . .

hundred _____ thousand _____

⑧ Round 54,681 to the nearest . . .

thousand _____ ten-thousand _____

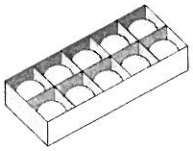
Grouping by Multiples of 10

Home Link 1-8

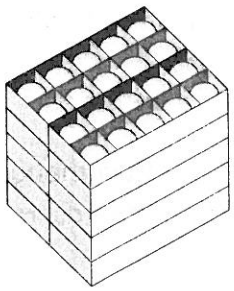
NAME DATE TIME

Alfie is ordering table tennis balls for the recreation center. A box holds 10 balls. A carton of table tennis balls holds 10 boxes.

SRB 102



Box of table tennis balls



Carton of table tennis balls

(1) How many table tennis balls are in one carton? _____

(2) Alfie ordered 7 cartons and 3 boxes of table tennis balls. How many balls did he order? _____

Show how you know your answer is correct.

(3) Explain how the cartons and boxes for table tennis balls are like the digits for numbers in our base-10 number system.

Practice

(4) 440 + 294 = _____

(5) 166 + 707 = _____

(6) _____ = 425 + 886

(7) 1,474 + 529 = _____

U.S. Traditional Subtraction

Home Link 1-9

NAME DATE TIME

Family Note In today's lesson students were introduced to U.S. traditional subtraction. The process is shown below for the problem 653 – 387.

SRB 82-84, 100-101

Step 1:

Start with the ones. Trade 1 ten for 10 ones. Subtract the ones.

	100s	10s	1s
		4	**13**
	6	~~5~~	~~3~~
–	3	8	7
			6

Step 2:

Go to the tens. Trade 1 hundred for 10 tens. Subtract the tens.

	100s	10s	1s
		14	
	5	~~4~~	13
	~~6~~	~~5~~	~~3~~
–	3	8	7
		6	6

Step 3:

Go to the hundreds. We don't need to regroup, so just subtract.

	100s	10s	1s
		14	
	5	~~4~~	13
	~~6~~	~~5~~	~~3~~
–	3	8	7
	2	6	6

Make an estimate. Write a number model to show what you did. Then solve using U.S. traditional subtraction. Compare your answer with your estimate to see whether your answer makes sense.

① 85 − 38 Estimate: _____	② 613 − 249 Estimate: _____	③ 506 − 187 = _____ Estimate: _____
④ 951 − 695 = _____ Estimate: _____	⑤ 1,544 − 749 Estimate: _____	⑥ 7,003 − 4,885 = _____ Estimate: _____

Practice

⑦ 740 + 294 = _____

⑧ 2,566 + 807 = _____

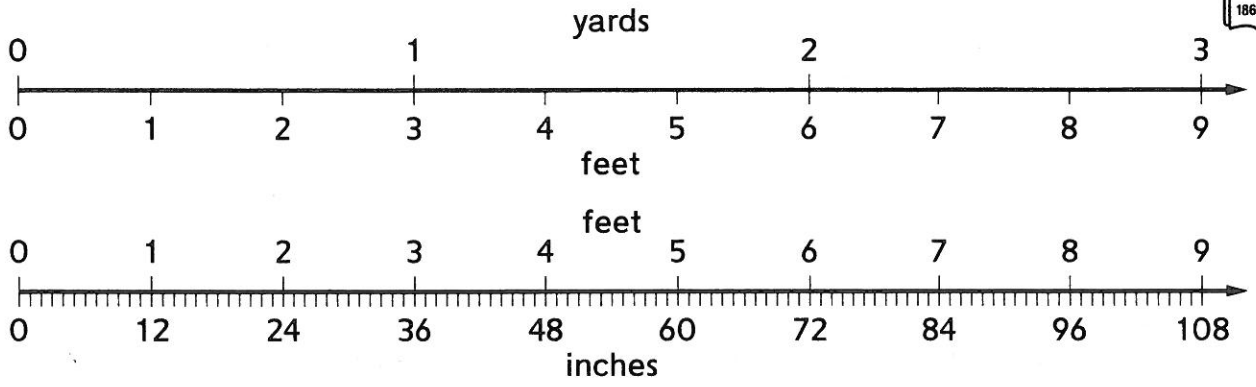
Snake Lengths

Home Link 1-10

NAME DATE TIME

Use the measurement scales to solve the problems.

SRB 186-187



①

Feet	Inches
1	
6	
8	
12	

②

Yards	Feet
1	
3	
8	
16	

③ The king cobra can measure a little over 4 yards in length. The black mamba can reach a length of almost 5 yards. What is the combined length of the two snakes in feet?

Answer: _____ feet

④ The Burmese python can be anywhere from 16 to 23 feet long. What is the difference in length in inches between the longest and shortest Burmese python?

Answer: _____ inches

Practice

⑤ Write 4,857 in words.

_____

⑥ Write 14,066 in words.

_____

Line Segments, Lines, and Rays

Home Link 1-11

NAME DATE TIME

SRB 226-227, 230-231

① List at least 5 things in your home that remind you of line segments.

Use a straightedge to complete Problems 2 and 3.

② **a.** Draw and label line *EF*.

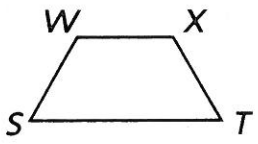
b. Draw and label line segment *EF*.

c. Explain how your drawings of line *EF* and line segment *EF* are different.

③ **a.** Draw and label ray *SR*.

b. Anita says ray *SR* can also be called ray *RS*. Do you agree? Explain.

④



Name the parallel line segments.

Practice

⑤
$$\begin{array}{r} 964 \\ -\ 348 \\ \hline \end{array}$$

⑥
$$\begin{array}{r} 662 \\ -\ 497 \\ \hline \end{array}$$

⑦
$$\begin{array}{r} 2,423 \\ -\ 1,491 \\ \hline \end{array}$$

Angles and Quadrilaterals

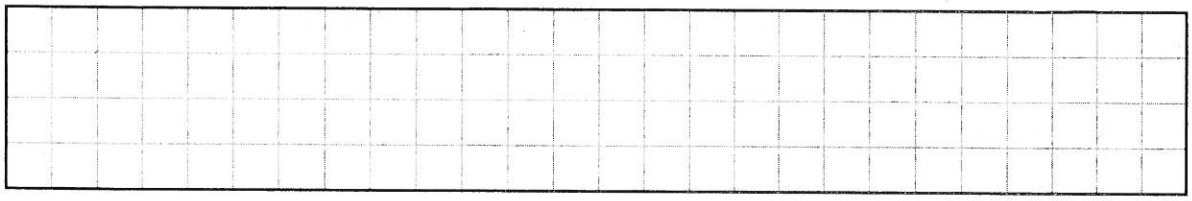
Home Link 1-12

NAME DATE TIME

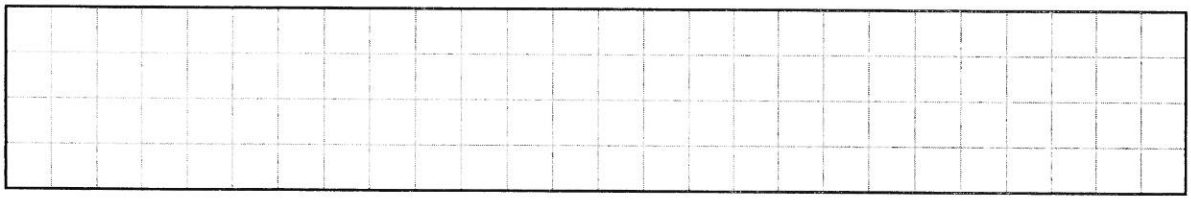
Use a straightedge to draw the geometric figures.

SRB 228-229, 233

(1) Draw 2 examples of a rectangle.



(2) Draw 2 examples of a right triangle.



(3) How are the shapes in Problems 1 and 2 similar? How are they different?

_____

_____

_____

(4) **a.** Draw right angle *DEF*.

(5) Draw an angle that is larger than a right angle. Label the vertex *K*.

b. What is the vertex of the angle? Point _____

c. What is another name for ∠***DEF***? _____

Practice

Use U.S. traditional subtraction.

(6) _____ = 756 − 348

(7) 700 − 450 = _____

(8) 7,942 − 3,887 = _____

Finding the Perimeter

Home Link 1-13

NAME DATE TIME

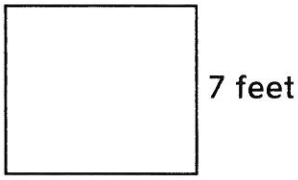
Family Note In class, students developed some rules, or *formulas,* for finding the perimeter of a rectangle. Here are three possible formulas:

- Add the measures of the four sides: perimeter of a rectangle = length + length + width + width. This formula can be abbreviated as: $p = l + l + w + w$.
- Add the two given sides and double the sum: perimeter of a rectangle = 2 * (length + width). This formula can be abbreviated as: $p = 2 * (l + w)$.
- Double the length, double the width, and then add: perimeter of a rectangle = (2 * length) + (2 * width). This formula can be abbreviated as: $p = 2l + 2w$.

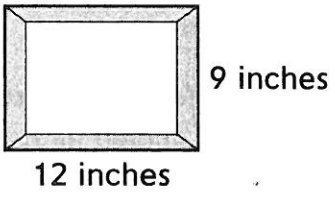
In all of the formulas, the letter p stands for the *perimeter of a rectangle,* the letter l stands for the *length of the rectangle,* and the letter w stands for the *width of the rectangle.*

Find the perimeters of the rectangles below.

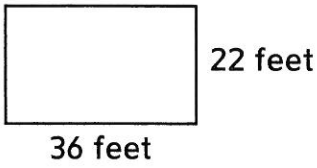
SRB 200

① 

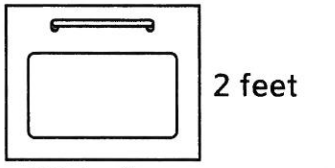
Perimeter: _____ feet

② 

Perimeter: _____ inches

③ 

Perimeter: _____ feet

④ 

Perimeter: _____ inches

⑤ The perimeter of a garden is 42 feet. The length is 15 feet. What is the width?

Width: _____ feet

Practice

Round each number to the nearest ten-thousand and hundred-thousand.

⑥ 421,492 _____ _____

⑦ 895,531 _____ _____