Unit 1: Family Letter

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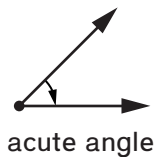
Geometry Students examine definitions and properties of 2-dimensional shapes and the relationships among them.

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°.
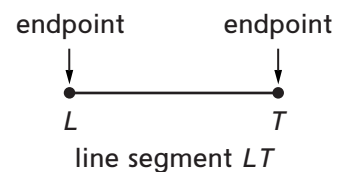

acute angle

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.
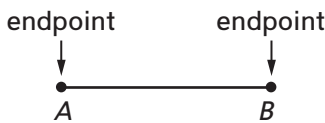
intersecting
lines and segments

intersecting
planes

line A straight path that extends infinitely in opposite directions.
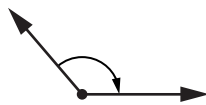
P   R

line *PR*

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

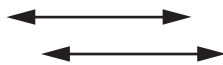endpoint   endpoint

A   B

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.

3 cm

1 cm   1 cm

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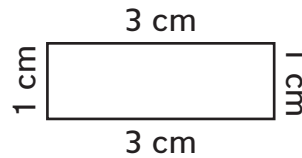
perimeter = 1 cm + 3 cm + 1 cm + 3 cm = 8 cm

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

C   A   D

B
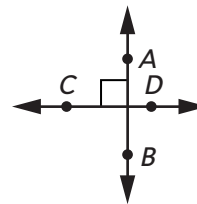
perpendicular
lines

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.

N   M

endpoint

ray *MN*

right angle An angle that measures exactly 90°.

**right triangle** A triangle that contains a right angle.
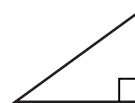
right triangle

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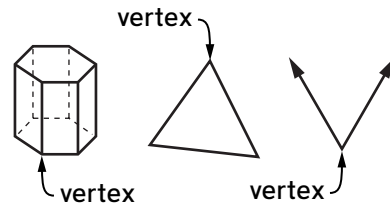
whole numbers The numbers 0, 1, 2, 3, 4, and so on.

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 XXX. This variation of *Addition Top-It* provides practice adding numbers through the thousands.

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

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

Subtraction Top-It (**Advanced Version**) See *Student Reference Book,* page XXX. 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; $500 - 200 = 300$
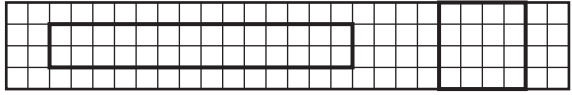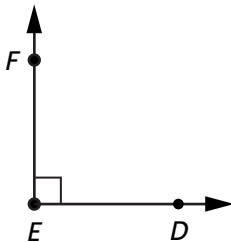
5. 795; $2,000 - 1,000 = 1,000$ **7.** 1,034
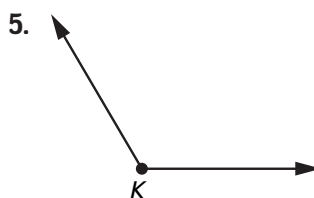
Home Link 1-10

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.** ∠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