

Whole Number Place Value and Operations

Students begin Unit 2 by exploring place-value relationships in multidigit numbers. They learn that a digit in a particular place-value position is worth 10 times as much when it moves one place to the left and $\frac{1}{10}$ as much when it moves one place to the right. In upcoming units students will learn that this pattern also applies to decimal numbers. Understanding our place-value system helps build an important foundation for estimating and computing with larger numbers. This unit also introduces students to powers of 10 and exponential notation. They notice and explain patterns in the number of zeros in the product when multiplying by powers of 10. Students apply their understanding of these patterns to make estimates for multiplication problems and check the reasonableness of answers.

The rest of the unit focuses on multiplying and dividing whole numbers. In previous grades of *Everyday Mathematics*® students learned several multiplication methods, including partial-products multiplication. In fifth grade, students learn to multiply whole numbers using U.S. traditional multiplication. This is the first exposure to U.S. traditional multiplication, so many students may find the algorithm challenging. Do not expect your child to use it easily right away. Students will have many opportunities throughout the year to practice using this algorithm. At home, challenge your child to a game of *Multiplication Top-It* to practice U.S. traditional multiplication or *Multiplication Bull's Eye* to practice estimating and checking the reasonableness of answers.

Finally, students review extended division facts and discuss the relationship between multiplication and division. They develop a strategy for dividing mentally and revisit partial-quotients division, a division strategy they first encountered in *Fourth Grade Everyday Mathematics*. Partial-quotients division uses “easy” multiplication facts and emphasizes the value of the digits being divided. Students often divide more accurately and with greater understanding using partial quotients than with traditional long division. Students will learn how to divide using U.S. traditional division in *Sixth Grade Everyday Mathematics*. In previous grades students divided multidigit numbers by 1-digit numbers. In this unit they extend their understanding of partial quotients to larger numbers (up to 4-digit dividends and 2-digit divisors). Partial-quotients division and other division methods are explained in the *Student Reference Book*. Students will use these strategies to solve division number stories and learn how to interpret remainders.

Please keep this Family Letter for reference as your child works through Unit 2.

Vocabulary

Important terms in Unit 2:

area model A model for multiplication in which the length and width of a rectangle represent the factors, and the area of the rectangle represents the product.

dividend In division, the number that is being divided. For example, in $35 \div 5 = 7$, the dividend is 35.

divisor In division, the number that divides another number. For example, in $35 \div 5 = 7$, the divisor is 5.

expanded form A way of writing a number as the sum of the values of each digit. For example, in expanded form, 356 can be written $300 + 50 + 6$ or $(3 * 100) + (5 * 10) + (6 * 1)$.

exponent A small, elevated number used in *exponential notation* to indicate how many times a factor should be repeated. For example, in 10^4 , the exponent is 4.

exponential notation A way to show repeated multiplication by the same factor. For example, 10^3 is exponential notation for $10 * 10 * 10$.

number model A number sentence or expression that models a number story or real-world situation.

place value A system in which the value of a digit depends on its place or position in a number. In our base-10 system for writing numbers, moving a digit one place to the left makes that digit worth 10 times as much. Moving a digit one place to the right makes that digit worth $\frac{1}{10}$ as much. For example, in the number 450 the 4 in the hundreds place is worth 400, but in the number 45 the 4 in the tens place is worth 40.

power of 10 A whole number that can be written as a product of 10s. For example, 100 is equal to $10 * 10$ and can be written 10^2 . 100 is called “the second power of 10,” “10 to the second power,” or “10 squared.”

quotient The result of dividing one number by another number. For example, in $35 \div 5 = 7$, the quotient is 7.

remainder The amount left over when one number is divided by another number. For example, if 38 books are divided into 5 equal piles, there will be 7 books per pile, with 3 books left over. Represented in symbols, this is $38 \div 5 \rightarrow 7 \text{ R}3$.

standard notation The most familiar way of representing whole numbers, integers, and decimals. In standard notation numbers are written using the base-10 *place-value* system. For example, standard notation for three hundred fifty-six is 356.

Do-Anytime Activities

To work with your child on the concepts taught in Unit 2, try these activities:

1. As you encounter numbers in daily life, ask your child to read them aloud and identify digits in the various places—ten-thousands, thousands, hundreds, tens, and ones.
2. Have your child estimate quantities of items that can be multiplied. For example, if there are 25 boxes of cereal on one shelf at the grocery store and there are 8 shelves of cereal, how many boxes might there be in the whole store?
3. Read the book *A Remainder of One* by Elinor J. Pinczes.
4. Ask your child to write number stories that can be solved using division and help him or her solve these problems. Identify how the quotient and remainder are used to answer the question in the number story.

Building Skills through Games

In Unit 2 your child will play the following games to practice interpreting exponential notation, multiplying, and dividing. Detailed instructions for each game may be found in the *Student Reference Book*. Many of the games can be played at home with a regular deck of playing cards by simply removing the face cards and having the ace represent 1.

Division Top-It: Larger Numbers See *Student Reference Book*, page 325. Two to four players need number cards 0–9 (4 of each). *Division Top-It: Larger Numbers* provides practice dividing larger numbers.

Multiplication Bull's Eye See *Student Reference Book*, page 313. Two players need number cards 0–9 (4 of each) and a 6-sided die. *Multiplication Bull's Eye* provides practice estimating products of 2- and 3-digit numbers.

Multiplication Top-It: Larger Numbers See *Student Reference Book*, page 325. Two to four players need number cards 0–9 (4 of each). *Multiplication Top-It: Larger Numbers* provides practice multiplying larger numbers.

Number Top-It See *Student Reference Book*, page 316. Two to five players need number cards 0–9 (4 of each). *Number Top-It* helps students apply their understanding of whole-number place value.

Power Up See *Student Reference Book*, page 318. Two players need two 6-sided dice. *Power Up* provides practice converting from exponential notation to standard notation and helps students notice patterns with powers of 10.

As You Help Your Child with Homework

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

Home Link 2-1

- | | | |
|------------|-----------|--------------|
| 1. 58,660 | 2. 92,776 | 3. 7,244 |
| 4. 330,600 | 5. 43,342 | 6. 9,864,320 |
| 7. 20 | 8. 50 | 9. 12 |
| 10. 5 | 11. 31 | 12. 48 |

Home Link 2-2

- | | |
|---------------------------------|--------------|
| 1. 1,000,000 | 2. 3,000,000 |
| 3. 1,000 | 4. 24,000 |
| 5. $300 < 2,000$ | |
| 6. $150,000,000 < 200,000,000$ | |
| 7. $2,700,000,000 > 90,000,000$ | |
| 8. 16 cubic feet | 9. \$26.00 |

Home Link 2-3

- Yes; Sample answer: To estimate the number of prizes Renee has, I rounded 47 to 50 and 22 to 20. I multiplied 50 and 20 to get 1,000. If each student wins 2 prizes, that's 380×2 . I can round 380 to 400 and multiply 400×2 . I know Renee needs about 800 prizes, so she has enough.
- No; Sample answer: If each student wins 3 prizes, Renee needs 380×3 prizes. If I round 380 to 400, then 400×3 is 1,200. Renee only has about 1,000 prizes, so she doesn't have enough.
- 42,000,000 4. 80
- Sample answer: 3×10^4
- Sample answer: 7×10^7

Home Link 2-4

1. 336
 2. 384
- Sample answers given for Problems 3–6.
3. $300 + 90 + 7$
 4. $1 * 1,000 + 2 * 100 + 6 * 10 + 8 * 1$
 5. $4,000 + 80 + 2$
 6. $(2 * 10^4) + (9 * 10^3) + (1 * 10^2) + (4 * 10^1) + (1 * 10^0)$

Home Link 2-5

- 1–2. Answers vary.
3. 10^2
 4. 10^4
 5. 10^8
 6. 10^3

Home Link 2-6

- 1–4. Answers vary.
- Estimates vary for Problems 5 and 6.
5. 2,864
 6. 1,508

Home Link 2-7

- Estimates vary for Problems 2–6.
2. 4,032
 5. 2,457
 6. 4,186
- 7a. 70,000
 - 7b. 70,000
 - 8a. 800
 - 8b. 800
 - 9a. 1,800,000
 - 9b. 1,800,000

Home Link 2-8

- Estimates vary for Problems 1–5.
1. 4,950
 2. 132,894
 3. 17,220
 4. 31,487
 5. 7,626
- 7a. 1,500,000
 - 7b. 1,500,000
 - 8a. 240,000
 - 8b. 240,000
 - 9a. 14,000,000
 - 9b. 14,000,000

Home Link 2-9

1. 6,000
 2. 300
- Estimates vary for Problems 3–4.
3. 2,033
 4. 83,850

Home Link 2-10

1. 3, 6, 9, 12, 15, 18, 21, 24, 27, 30; Sample answer: $30 + 27; 19$
2. 8, 16, 24, 32, 40, 48, 56, 64, 72, 80; Sample answer: $80 + 16; 12$

Estimates vary for Problems 3–4.

3. 1,564
4. 4,170

Home Link 2-11

1. 10, because there are 10 [11s] in 110.
- Estimates vary for Problems 2–5.
2. 32 R5
 3. 24 R0
 4. 2,253
 5. 8,084

Home Link 2-12

1. $100 * 18 = 1,800$; $50 * 18 = 900$; $20 * 18 = 360$; $10 * 18 = 180$; $5 * 18 = 90$; $2 * 18 = 36$
 2. Sample estimate: $1,800 / 18 = 100$; 108 R10
- Estimates vary for Problems 3–4.
3. 77 R7
 4. 34 R2

Home Link 2-13

1. 4 R4; 4 pizzas; Ignored it; The \$4 left over won't buy another pizza.
 2. 7 R10, 8 bins; Rounded the quotient up; 7 bins will hold 140 books. One more bin is needed for the 10 books left over.
- Estimates vary for Problems 3–4.
3. 12 R10
 4. 14 R7