Introduction to *Second Grade Everyday Mathematics*

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

Here we describe several features of the program to familiarize you with the structure of *Everyday Mathematics* and the expectations we have for children.

A Problem-Solving Approach Based on Everyday Situations By connecting what children learn to their experiences both in and out of school, *Everyday Mathematics* presents basic math skills and concepts in meaningful contexts so that the mathematics becomes "real."

Frequent Practice of Basic Skills In *Everyday Mathematics,* children practice basic skills in a number of different ways—but *not* through tedious drilling. Second graders complete daily review exercises covering a host of topics. They learn to find patterns on the number line and the number grid, explore addition and subtraction fact families in a variety of formats, work with Quick Looks and ten frames, and play games specifically designed to help them develop basic skills.

An Instructional Approach That Revisits Concepts Regularly The best way for children to develop their mathematical understanding is to regularly revisit skills and concepts they encountered earlier. Rather than presenting mathematics as isolated bits of content, the *Everyday Mathematics* curriculum is designed to build on children's learning throughout the year. Research shows that repeated exposure to math concepts and skills over time develops children's abilities to recall knowledge from long-term memory.

A Curriculum That Explores Mathematical Content and Practices The rich problem-solving environment provided by *Everyday Mathematics* helps children develop critical-thinking skills. They learn to solve new kinds of problems, explain their thinking to others, and make sense of other children's thinking.

Second Grade Everyday Mathematics emphasizes the following content:

Numbers and Operations in Base 10
Understanding place value through counting, making coin exchanges, reading and writing numbers, and comparing numbers; using place-value understanding to add and subtract whole numbers.

Operations and Algebraic Thinking Solving addition and subtraction problems; developing fluency with addition and subtraction facts; exploring fact families (related addition and subtraction facts, such as $2 + 5 = 7$, $5 + 2 = 7$, $7 - 5 = 2$, and $7 - 2 = 5$); gaining foundations for multiplication and division.

Measurement and Data Estimating lengths and using tools to measure length; telling time to the nearest 5 minutes; solving problems involving money; collecting, organizing, and representing data with tables and graphs.

Geometry Recognizing and drawing 2-dimensional shapes and identifying select 3-dimensional shapes.

Everyday Mathematics provides you with many opportunities to share in your child's mathematical experience and monitor the progress your child makes. Throughout the year you will receive Family Letters like this one to keep you informed of the mathematical content your child is 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.

We look forward to an exciting year!

Unit 1: Establishing Routines

This unit reviews and extends mathematical concepts that were developed in *First Grade Everyday Mathematics.* In Unit 1 children will do the following:

- Use number lines to count, compare numbers, add, and subtract.

- Count in several different intervals, such as up by 2s, up by 10s, back by 10s from 100.

- Review whole numbers by completing assigned tasks, such as writing the number that comes after 509, writing the number that comes before 1,001, and writing the number word for 50.

- Count coins and find the values of coin combinations.

- Work with a number grid to reinforce place-value skills and observe number patterns.

−9	−8	−7	−6	−5	−4	−3	−2	−1	0
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

- Review equivalent names for numbers, which are different ways numbers can be expressed. For example, some equivalent names for 10 are $5 + 5$, $20 - 10$, ten, and ���� ����.

- Play games, such as *Fishing for 10,* to strengthen number skills and develop fact fluency.

- Explore patterns involving odd and even numbers.

- Review and use the symbols > (is greater than), < (is less than), and = (is equal to).

Do-Anytime Activities

Try these interesting and rewarding activities to practice concepts taught in this unit:

- Discuss examples of mathematics in everyday life: times in TV listings, distances or speeds on road signs, prices in ads or store displays, recipe measurements, and so on.

- Discuss the rules for working with a partner or in a group.

  - Be polite.
  - Help each other.
  - Share.
  - Listen to your partner.
  - Respond to your partner.
  - Talk about problems.
  - Take turns.
  - Speak quietly.

- Discuss household tools that can be used to help solve mathematical problems, such as tape measures, thermometers, and clocks.

- Count combinations of pennies, nickels, dimes, and quarters.

- Look for number lines on everyday objects, such as rulers, speedometers, and thermometers.

Vocabulary   Important terms in Unit 1:

Math Message A daily activity that children complete independently, usually as a lead-in to the day's lesson. Example: *Make tally marks to show how many children are here today.*

Math Journal A book used by each child. It contains examples, instructions, and problems, as well as space to record answers and observations.

toolkits Individual zippered bags or boxes used in the classroom. Each toolkit contains various items—such as a ruler, play money, and number cards—that are used to help children understand mathematical ideas.

Mental Math and Fluency A daily whole-class oral or written activity, often emphasizing computation children learn to do in their heads.

number grid A table in which numbers are arranged consecutively, usually in rows of 10. A move from one number to the next left or right in a row is a change of 1; a move from one number to the next up or down in a column is a change of 10.

Exploration A small-group, hands-on activity designed to introduce or extend a mathematical topic.

Math Boxes Math problems in the *Math Journal* that provide opportunities for children to review and practice previously introduced skills.

Home Links *Everyday Mathematics* daily homework. Each Home Link includes problems and activities intended for follow-up and enrichment at home.

As You Help Your Child with Homework

When your child brings home an assignment, you may want to go over the instructions together, clarifying them as necessary. Each Family Letter will contain answers, such as the following, to guide you through the unit's Home Links.

Lesson 1-11

1. Answers vary.

2. Answers vary.

3. Answers vary.

4. <

5. >

6. >

7. =

8. Answers vary.

9. Answers vary.

Lesson 1-12

158; Answers vary.

Open Response and Reengagement Lessons

A two-day lesson in each unit of *Second Grade Everyday Mathematics* is an Open Response and Reengagement lesson. In these lessons children solve interesting problems using their own strategies and reasoning. On Day 1 children solve an open response problem—a problem with more than one possible strategy or solution. On Day 2 the class discusses children's work from Day 1 to "reengage" with the problem and learn more about the mathematics involved. Children then revise their work based on what they learn from the discussion.

These lessons are not assessments, but opportunities for children to solve approachable problems that require persistence. Children's work on Day 1 reveals both strengths and weaknesses, allowing the discussion on Day 2 to focus on areas that need improvement. From these discussions, children find that learning from mistakes is a natural part of mathematical problem solving. Explaining their thinking and listening to the explanations of others builds children's confidence. At the same time, children see that there is more than one way to solve a problem, which promotes creative solutions to new problems. Having an opportunity to revise their work helps children realize that they can be successful tackling hard tasks if they think about them and keep trying.

The open response problem in this unit asks children to look for patterns in a number grid and use the patterns to identify missing numbers in a "number-grid puzzle." They also write explanations about how they figured out two of the missing numbers.
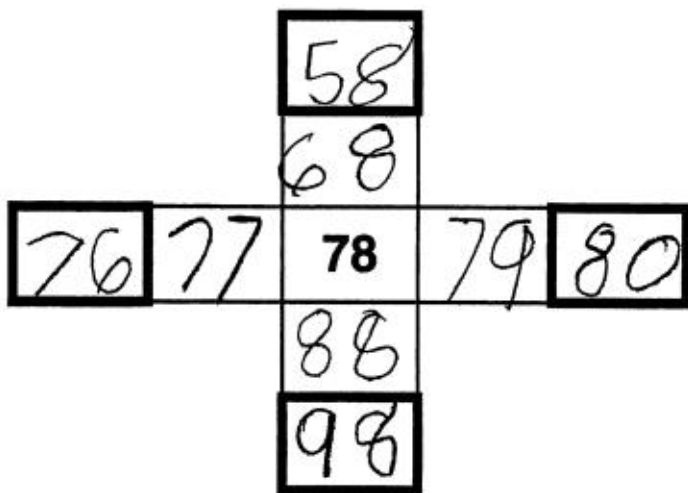
Number-Grid Puzzle

These lessons continue work on problem solving that is central to *Everyday Mathematics* across all the grades. We hope you enjoy seeing your child become a confident problem solver. Ask your child to talk to you about the problems and his or her mathematical thinking throughout the year.

Relations: <, >, =

Family Note

In *Second Grade Everyday Mathematics,* children "do mathematics." We expect that children will want to share their enthusiasm for the mathematics activities they do in school with their families. Your child will bring home assignments and activities to do as homework throughout the year. These assignments, called Home Links, will be identified by the house at the top right corner of this page. The assignments will not take very much time to complete, but most of them involve interaction with an adult or an older child.

There are many reasons for including Home Links in the second-grade program:

• The assignments encourage children to take initiative and responsibility for completing them. As you respond with encouragement and assistance, you help your child build independence and self-confidence.

• Home Links reinforce newly learned skills and concepts. They provide opportunities for children to think and practice at their own pace.

• These assignments are often designed to relate what is done in school to children's lives outside school. This helps tie mathematics to the real world, which is very important in the *Everyday Mathematics* program.

• The Home Links will give you a better idea of the mathematics your child is learning in school.

Generally, you can help by listening and responding to your child's requests and comments about mathematics. You also can help by linking numbers to real life, pointing out ways in which you use numbers (time, TV channels, page numbers, telephone numbers, bus routes, shopping lists, and so on). Extending the notion that "children who are read to, read," *Everyday Mathematics* supports the belief that children who have someone do math with them will learn mathematics. Playful counting and thinking games that are fun for both you and your child are very helpful for such learning.

Please return the second page of this Home Link to school tomorrow.

Relations: <, >, =
(continued)

Family Note

MRB

Page 75

This icon will often appear on the Home Links. This icon tells children where to look in *My Reference Book* to find more information about the concept or skill addressed in the Home Link. In today's lesson, we reviewed and practiced using the <, >, and = symbols. For information about relation symbols, see page 75 in *My Reference Book*.

Show someone at home your *My Reference Book.* Together find three things you found interesting and write them below.

1 _____

2 _____

3 _____

Explain to someone at home how to do Problems 4–7.
Then write <, >, or = on each blank. Use *My Reference Book* to look up the symbols.

4 8 _____ 12

5 25¢ _____ 18¢

6 103 _____ 53

7 79¢ _____ 79¢

Write numbers in the blanks to make up your own.

8 _____ < _____

9 _____ > _____

Base-10 "Buildings"

## Family Note

In today's lesson, children were introduced to Grade 2 Explorations. Explorations are small-group, hands-on activities designed to introduce or extend mathematical topics. One of the Explorations reviewed the values represented by base-10 blocks. Children made "buildings" with the blocks and calculated the values of the buildings.

Please return this Home Link to school tomorrow.

Look at the picture of a "building" that is made with base-10 blocks.

MRB
72, 77-78
104-105
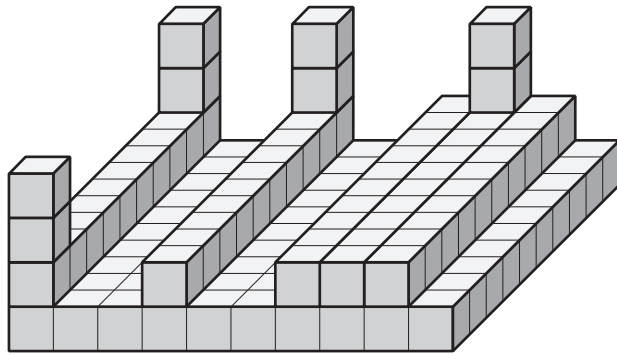
■	=	1
|	=	10
□	=	100

Count the value of the flats, longs, and cubes that make up the building. What number does the building show? Use the symbols in the box to help you. _____

Write about how you counted the blocks.

_____

_____

_____

Fact Strategies

Unit 2 focuses on developing strategies for solving addition facts. In *Everyday Mathematics* children learn basic facts by first focusing on specific groups of facts that can be solved using a particular strategy. Children build fluency and automatic recall as they develop strategies for all the different groups of facts. Achieving automatic recall of basic addition facts will enable your child to solve multidigit computation problems with ease later in the year.

Everyday Mathematics **Program Routines**

Your child will use two new program routines in this unit. **Name-collection boxes** provide a space for children to collect equivalent names for numbers. **Frames-and-Arrows diagrams** show sequences of numbers following a certain pattern. More information about these routines can be found in the Family Notes on Home Links 2-10 and 2-12.

10

ten	$1 + 9$
diez	$12 - 2$
$6 + 4$	$10 - 0$

A name-collection box

Rule
$- 5$

35	30	25	20	15	10
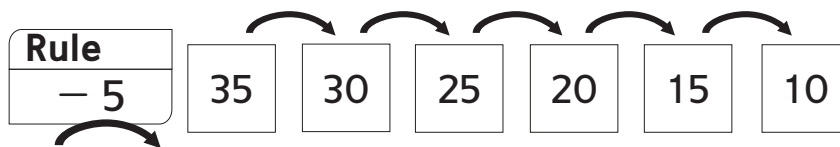
A frames-and-arrows diagram

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

Vocabulary   Important terms in Unit 2:

label A unit, descriptive word, or phrase used to put a number or numbers in context. Using a label reinforces the idea that numbers often refer to something.

unit box A box that contains the label or unit of measure for the numbers in a problem. *For example:* In number stories that involve counting children in the class, the word *children* would go in the unit box.

Unit
children

number model A number sentence or other representation that fits a number story or situation. *For example:* $5 + 8 = 13$ models the number story "There are 5 children skating. There are 8 children playing ball. How many children are there in all?"

number story A story involving numbers that is made up by children, teachers, or parents. Children solve problems posed in number stories using many different methods. In Grade 2, number stories focus on addition and subtraction.

doubles fact An addition fact in which a number is added to itself, such as $4 + 4 = 8$ and $9 + 9 = 18$.

**combination of 10** An addition fact with a sum of 10, such as $6 + 4 = 10$ and $7 + 3 = 10$.

addend Any one of a set of numbers that is added. *For example:* In $5 + 3 = 8$, the addends are 5 and 3.

turn-around rule for addition A rule that says you can add two numbers in either order and get the same result (for example, $3 + 5 = 8$ and $5 + 3 = 8$).

name-collection box An empty box used to collect equivalent names for a given number. The tag in the top left corner identifies the number whose names are collected in the box.

Frames-and-Arrows diagram A diagram used to represent a number sequence, which is a list of numbers that follow some rule. A Frames-and-Arrows diagram consists of frames connected by arrows that show the path from one frame to the next. Each arrow represents a rule that determines which number goes in the next frame so that all of the frames contain the numbers in the sequence.

Rule
− 5

35	30	25	20	15	10

10

ten	$1 + 9$
diez	$12 − 2$
$6 + 4$	$10 − 0$
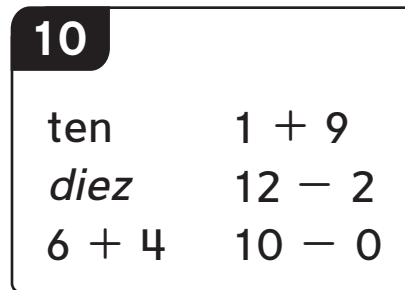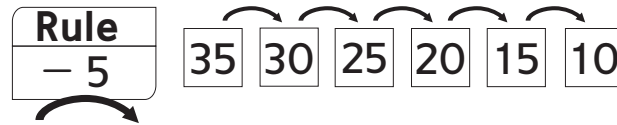
Building Skills through Games

In Unit 2 your child will explore place-value concepts and practice addition facts by playing the following games.

The Exchange Game
Each player rolls a die and collects that number of $1 bills from the bank. As players accumulate bills, they exchange ten $1 bills for one $10 bill and ten $10 bills for one $100 bill.

Evens and Odds
Each player draws a card. If the card shows an even number, the player writes it as a sum of two equal addends. If the card shows an odd number, the player writes it as the sum of two equal addends plus or minus 1. *For example:* A player who draws a 6 writes $3 + 3 = 6$, and a player who draws a 7 writes $3 + 3 + 1 = 7$ or $4 + 4 − 1 = 7$.

Name That Number
Players turn over a card to show a target number that must be renamed using any combination of five faceup cards.

4	10	8	12	2		6

$6 = 8 − 2$

$6 = 10 − 4$

$6 = 4 + 2$

Do-Anytime Activities

To work with your child on the mathematical concepts taught up to this point in the school year, try these interesting and rewarding activities:

1. Talk with your child about why it is important to learn basic facts.

2. Create addition number stories about common objects in your child's environment.

3. Have your child explain his or her favorite fact strategy to you.

4. Name a number and ask your child to think of several different ways to represent it. *For example:* 10 can be represented as 1 + 9, ten tally marks, the word *ten,* and so on.

5. Ask your child to make fair exchanges between $1 and $10 bills or among coins.

6. Call out numbers and ask your child whether the numbers are even or odd.

As You Help Your Child with Homework

Your child will regularly bring home assignments with instructions you may want to go through together, clarifying them as necessary. The following represent the answers to every problem in the Unit 2 Home Links.

Home Link 2-1
1. 1
2. 100
3. 10
4. Sample answers: 5; 50
5. $14
6. $29
7. $120

Home Link 2-2
1. Answers vary.
2. 4
3. 8
4. 10
5. 14

Home Link 2-3
1. **a.** 4 **b.** 10 **c.** 0 **d.** 2 **e.** 14 **f.** 3 **g.** 16
2. Sample answers: 10 + 0; 9 + 1; 8 + 2; 7 + 3; 6 + 4; 5 + 5

Home Link 2-4
1. 10 + 0 = 10; 9 + 1 = 10; 8 + 2 = 10; 7 + 3 = 10; 6 + 4 = 10; 5 + 5 = 10; 4 + 6 = 10; 3 + 7 = 10; 2 + 8 = 10; 1 + 9 = 10; 0 + 10 = 10
2. 11; 8 + 2 = 10
3. 11; 4 + 6 = 10
4. 12; 9 + 1 = 10

Home Link 2-5
1. Answers: 9, 11; Helper fact: 10
2. Answers: 13, 15; Helper fact: 14
3. 7; Helper fact: 4 + 4 = 8 or 3 + 3 = 6

Home Link 2-6

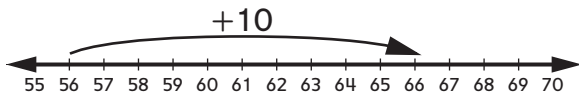**1.** $2 + 4 = 6; 4 + 2 = 6$

2. $3 + 5 = 8; 5 + 3 = 8$

3. $4 + 6 = 10; 6 + 4 = 10$

4. $3 + 8 = 11; 8 + 3 = 11$

5. 10   **6.** 10

7. 10   **8.** 10

Home Link 2-7

1. $6 + 8 = 14; 8 + 6 = 14$

2. 15; $3 + 12 = 15$

  3; $3 + 8 = 11$

3. a. 3   **b.** 5   **c.** 7   **d.** 6

Home Link 2-8

1. Answer: 66

$$+10$$

55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70

2. Answer: 66

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

Home Link 2-9

Children should circle 6, 18, 8, 14, 4, 10, 16, 2, 20, and 12; they should underline 9, 3, 11, 17, 15, 1, 7, 19, 13, and 5.

$7 \rightarrow 3 + 3 + 1$

$8 \rightarrow 4 + 4$

$11 \rightarrow 6 + 6 - 1$

$14 \rightarrow 7 + 7$

$17 \rightarrow 8 + 8 + 1$

$10 \rightarrow 5 + 5$

Home Link 2-10

1. Answers vary.

2. Sample answers: Ten, $11 - 1$, $10 - 0$, $10 + 0$, $5 + 5$, $13 - 3$, $8 + 1 + 1$, $2 + 2 + 2 + 2 + 2$,
~~卌~~ ~~卌~~,
X X X X X
X X X X X

3. Answers vary.

Home Link 2-11

1. Sample answers: $6 + 6 = 12$; $10 + 2 = 12$

2. Sample answers: $9 - 4 = 5$; $6 - 1 = 5$

3. Sample answers: $9 - 3 = 6$; $4 + 2 = 6$

4. 3   **5.** 1

6. 8   **7.** 10

Home Link 2-12

1.
Rule
$+2$

32 34 36 38 40

2.
Rule
-5

45 40 35 30 25

3.
Rule
$+10$

38 48 58 68 78

4.
Rule
$+3$

8 11 14 17 20

5. Answers vary.