Contents

Foreword 5
User Guide 7

Chapter 7: Four-Digit Numbers

Introduction 11
Thousands 14
Four-Digit Numbers and Place Value 18
Comparing Numbers 23
Add and Subtract Four-Digit Numbers 1 25
Add and Subtract Four-Digit Numbers 2 27
Add Four-Digit Numbers in Columns 29
Subtract Four-Digit Numbers with Regrouping 31
More Practice 34
Word Problems 37
Mixed Review Chapter 7 39
Review Chapter 7 41

Chapter 8: Division

Introduction 43
Division as Making Groups 47
Division and Multiplication 50
Multiplication and Division Fact Families 53
Dividing Evenly into Groups 56
Multiplication and Division Word Problems 59
More Word Problems 61
Zero in Division 63
Division Practice 65
Missing Numbers 68
Bar Graphs 70
Pictographs 74
When Division Is Not Exact 77
Mixed Review Chapter 8 80
Review Chapter 8 82

Chapter 9: Measuring

Introduction 85
Measuring to the Nearest Fourth-Inch 87
Line Plots 90
Centimeters and Millimeters 92
Grams and Kilograms 95
Milliliters and Liters 99
Pounds and Ounces 101
Cups, Pints, Quarts, and Gallons 104
Word Problems and More 106
Mixed Review Chapter 9 108
Review Chapter 9 111

Chapter 10: Geometry

Introduction 115
Polygons 119
Some Special Quadrilaterals 124
More Practice with Shapes 126
Getting Started with Area 129
Units for Measuring Area 133
Area of Rectangles 1 137
Area of Rectangles 2 140
More Units for Measuring Area 143
Area of Compound Shapes 1 145
Area of Decomposed Rectangles 147
Multiplying by Multiples of Ten 151
Area of Compound Shapes 2 153
Perimeter 155
More About Perimeter 158
Area and Perimeter Problems 160
Same Area, Different Perimeter 162
Same Perimeter, Different Area 164
More Practice 166
Mixed Review Chapter 10 168
Review Chapter 10 172

Chapter 11: Fractions

Introduction 175
Understanding Fractions 1 178
Understanding Fractions 2 182
Fractions on a Number Line 1 186
Fractions on a Number Line 2 189
Equivalent Fractions 1 193
Equivalent Fractions 2 195
Equivalent Fractions 3 197
Comparing Fractions 1 199
Comparing Fractions 2 202
Comparing Fractions 3 205
Mixed Review Chapter 11 207
Review Chapter 11 211

Chapter 7: Four-Digit Numbers
Introduction

This chapter focuses on four-digit numbers. The first lessons cover place value and comparing four-digit numbers. The rest of the chapter deals with addition, subtraction, and word problems.

First, students learn to write and read four-digit numbers. Then they learn about the concept of place value, write numbers in expanded form, and place them on number lines. One lesson is spent comparing numbers.

Then we turn our attention to addition and subtraction, first using mental math. The lessons on mental math stress the similarities between adding and subtracting four-digit numbers and adding and subtracting smaller numbers. This helps build number sense.

Several lessons are spent on adding and subtracting four-digit numbers in columns and practicing regrouping. Students also solve a variety of word problems involving four-digit numbers along the way.

Overall, this chapter is probably fairly easy for most students in the fact it mostly has to do with place value, addition, and subtraction. I advise that you do not assign all the exercises by default. Use your judgment, and strive to vary the number of assigned exercises according to the student's needs.

Good Mathematical Practices

- This chapter has lots of opportunities to focus on accuracy (precision) and checking one's own work. Addition problems can be checked by adding each column in a different order. Subtraction problems can be checked by adding. Sometimes children hurry through their work and thus make mistakes. Don't assign so much work that it creates time-related stress. Less can be more! Emphasize to your student(s) that they can take time to compute carefully, and to check their own work.

Note Concerning the Common Core Standards (CCS)

The CCS specify that in grade 2, students learn numbers up to 1,000, and that in grade 4, students learn numbers up to 1 million. There is no mention of studying numbers and place value in grade 3; however I have decided to include 4-digit numbers here (numbers up to 10,000). I feel a more gradual progression towards large numbers is easier for students.

The topics of this chapter therefore technically belong to fourth grade. This entire chapter can be safely omitted without affecting the subsequent chapters in third grade.

However, keep in mind the following. Chapter 1 of Math Mammoth Grade 4 curriculum (2020 edition) has a few exercises that use four-digit numbers. Also, and the coverage of large numbers in Chapter 2 of Math Mammoth Grade 4 (2020 edition) picks up where this chapter leaves off. If you want or need to delay this topic till fourth grade, you could use some or all of these lessons as part of studying chapter 2 in grade 4.

Pacing Suggestion for Chapter 7

This table does not include the chapter test as it is found in a different book (or file).
Please add one day to the pacing for the test if you use it.

The Lessons in Chapter 7	page	span	suggested pacing	your pacing
Thousands	14	*4 pages*	1 day	
Four-Digit Numbers and Place Value	18	*5 pages*	2 days	
Comparing Numbers	23	*2 pages*	1 day	
Add and Subtract Four-digit Numbers 1	25	*2 pages*	1 day	
Add and Subtract Four-digit Numbers 2	27	*2 pages*	1 day	

Add Four-digit Numbers in Columns	29	*2 pages*	1 day
Subtract Four-digit Numbers with Regrouping	31	*3 pages*	1 day
More Practice	34	*3 pages*	1 day
Word Problems	37	*2 pages*	1 day
Mixed Review Chapter 7	39	*2 pages*	1 day
Review Chapter 7	41	*2 pages*	1 day
Chapter 7 Test (optional)			
TOTALS		*29 pages*	11 days

Games and Activities

Making Numbers

You need: Base-ten blocks (manipulatives)

Ask the child to make a particular four-digit number using the manipulatives, such as 2,308. Take turns, so that the child will tell you a number to make. Occasionally, when you make the number with the blocks, make a mistake on purpose so that the child can find it.

9-Card Draw to a Target

You need: Number cards from 0 through 9. (Standard playing cards work if you make, say, the ten to be zero. Or, play with numbers 1-9.) Paper and pencil for each player.

Game play: Choose a target number from 3000, 4000, 5000, 6000, or 7000 (using a target number that is not a multiple of 1000 will make it more challenging). Choose whether to use addition or subtraction.

Each player takes nine cards from the deck, and uses those to form two four-digit numbers to add or subtract (one card is left unused). Each player adds or subtracts the two numbers they formed, using paper & pencil or mental math. (Once you figure out the basic strategy for the game, mental math works much better.) The player closest to the target wins a point for that round.

The player with the highest number of points after, say, five rounds, wins.

*This game is adapted from **https://www.earlyfamilymath.org** and published here with permission.*

Missing Number Puzzles

Create puzzles for your student(s) by making an addition or subtraction problem, and leaving out some of the digits. See an example on the right.

For this chapter, use four-digit addition and four-digit subtraction problems that involve regrouping.

Original:

$$\begin{array}{r} 7\,2\,6\,5 \\ -\;2\,6\,7\,3 \\ \hline 4\,5\,9\,2 \end{array}$$

→

Puzzle form:

$$\begin{array}{r} \square\,2\,\square\,\square \\ -\;2\,\square\,7\,3 \\ \hline 4\,5\,9\,2 \end{array}$$

You can also reverse the roles, and have your student make these types of puzzles for you to solve. Have your student check your work — and sometimes, make an intentional mistake for them to find!

*This activity is from **https://www.earlyfamilymath.org** and published here with permission.*

Games and Activities at Math Mammoth Practice Zone

Make Number Sentences
You're given numbers (in flowers), and an answer to a math sentence. Drag two flowers to the empty slots so that the math sentence is true. Choose addition and/or subtraction, and number ranges within four-digit numbers.
https://www.mathmammoth.com/practice/number-sentences

Vertical Addition Color-Grid Game
Practice vertical (column) addition with this fun and colorful online game! Choose a maximum of 9000 and 2-4 addends to practice four-digit additions.
https://www.mathmammoth.com/practice/vertical-addition

Vertical Subtraction Color-Grid Game
Practice vertical (column) subtraction with this colorful online game! Choose a maximum of 9999 for the numbers to practice four-digit subtractions.
https://www.mathmammoth.com/practice/vertical-subtraction

Helpful Resources on the Internet

We have compiled a list of Internet resources that match the topics in this chapter, including pages that offer:

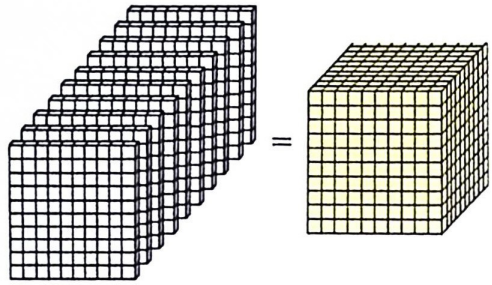
- **online practice** for concepts;
- online **games**, or occasionally, printable games;
- **animations** and interactive **illustrations** of math concepts;
- **articles** that teach a math concept.

We heartily recommend you take a look! Many of our customers love using these resources to supplement the bookwork. You can use these resources as you see fit for extra practice, to illustrate a concept better and even just for some fun. Enjoy!

https://l.mathmammoth.com/2024/gr3ch7

Scan me

Thousands

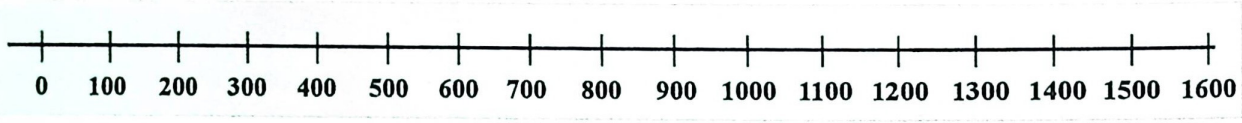


10 hundreds = 1,000

When we stack 10 hundred-flats end-to-end, we get *one thousand.*

Ten hundreds = One thousand.

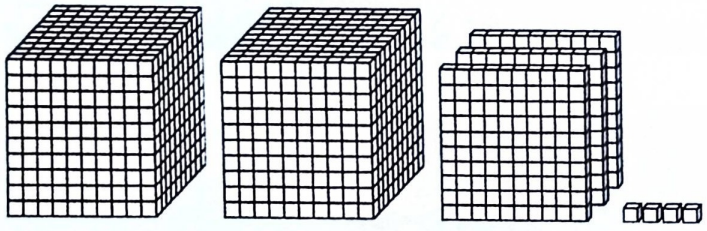
We write one thousand as 1000 or 1,000. The comma is used to separate the "1" of the thousands from the other digits. It just makes it easier to read.



On this number line, you see only whole hundreds (multiples of hundred) marked. In between each two marks are 99 numbers. Imagine 99 little lines between 300 and 400, for example!

When counting by 100, after 900 comes "ten hundreds" or A THOUSAND (1,000).

If we continue skip-counting by 100 from 1,000, we get: *one thousand one hundred*, *one thousand two hundred*, *one thousand three hundred*, and so on. People often read these numbers this way: *eleven hundred*, *twelve hundred*, *thirteen hundred*, and so on.



2,304

two thousand three hundred four

Here you see two thousands, three hundreds, no tens, and four ones (units).

We write it as 2,304.

Six thousand eighteen

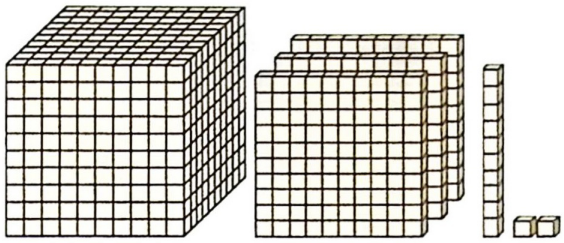
thou-sands	hund-reds	tens	ones
6	0	1	8

Numbers with four digits are very easy to read. The first digit is in the thousands place. Just read it as "one thousand", "two thousand", "five thousand", and so on.

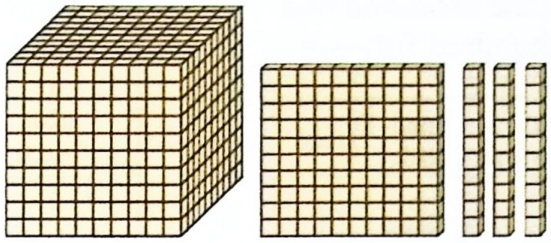
Read the rest of the digits just like you are used to reading three-digit numbers.

1. (Optional) Do the activity **Making Numbers**. (See the chapter introduction.)

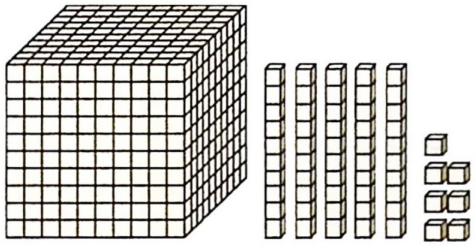
2. Write the numbers shown by the models. Note: sometimes you will need to use a zero.

a. 

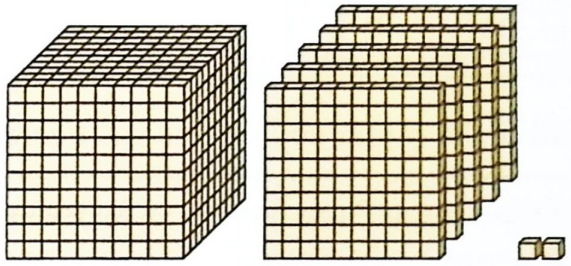
thou-sands	hund-reds	tens	ones

b. 

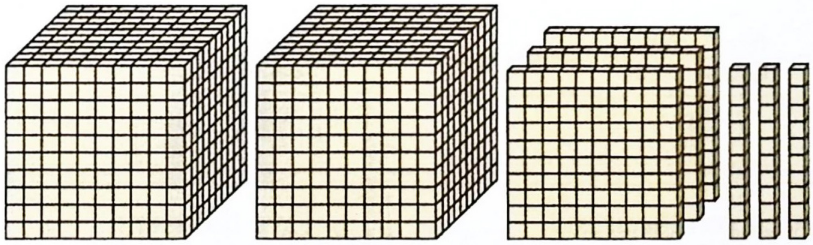
thou-sands	hund-reds	tens	ones

c. 

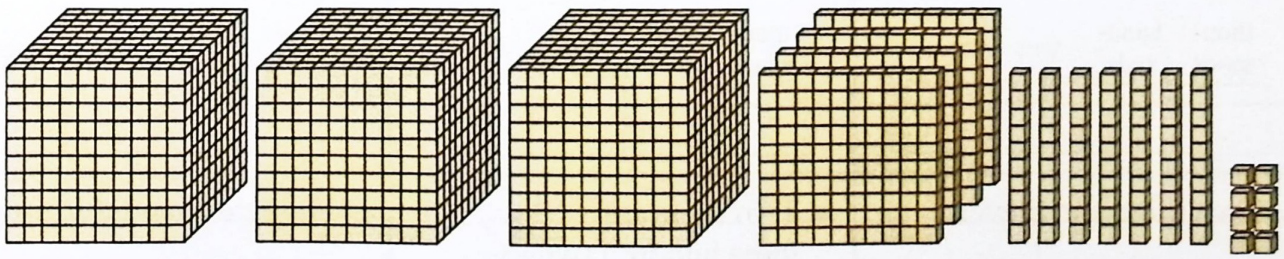
thou-sands	hund-reds	tens	ones

d. 

thou-sands	hund-reds	tens	ones

e. 

thou-sands	hund-reds	tens	ones

f. 

thou-sands	hund-reds	tens	ones

3. Fill in.

a. One thousand two hundred fifty-six

thou-sands	hund-reds	tens	ones
1	2	5	6

b. Three thousand five hundred ninety-four

thou-sands	hund-reds	tens	ones

c. Four thousand six hundred seventeen

thou-sands	hund-reds	tens	ones

d. Nine thousand eight hundred twenty-two

thou-sands	hund-reds	tens	ones

e. Six thousand two hundred eleven

thou-sands	hund-reds	tens	ones

f. Five thousand seven hundred ninety-nine

thou-sands	hund-reds	tens	ones

4. Fill in. Now you will need to use a zero or zeros, so be careful!

a. One thousand one

thou-sands	hund-reds	tens	ones
1	0	0	1

b. Two thousand five

thou-sands	hund-reds	tens	ones

c. Four thousand sixty-one

thou-sands	hund-reds	tens	ones

d. Three thousand twelve

thou-sands	hund-reds	tens	ones

e. Six thousand two hundred

thou-sands	hund-reds	tens	ones

f. Five thousand ninety

thou-sands	hund-reds	tens	ones

g. One thousand one hundred three

thou-sands	hund-reds	tens	ones

h. Seven thousand five hundred six

thou-sands	hund-reds	tens	ones

i. Five thousand eight hundred

thou-sands	hund-reds	tens	ones

j. Two thousand eleven

thou-sands	hund-reds	tens	ones

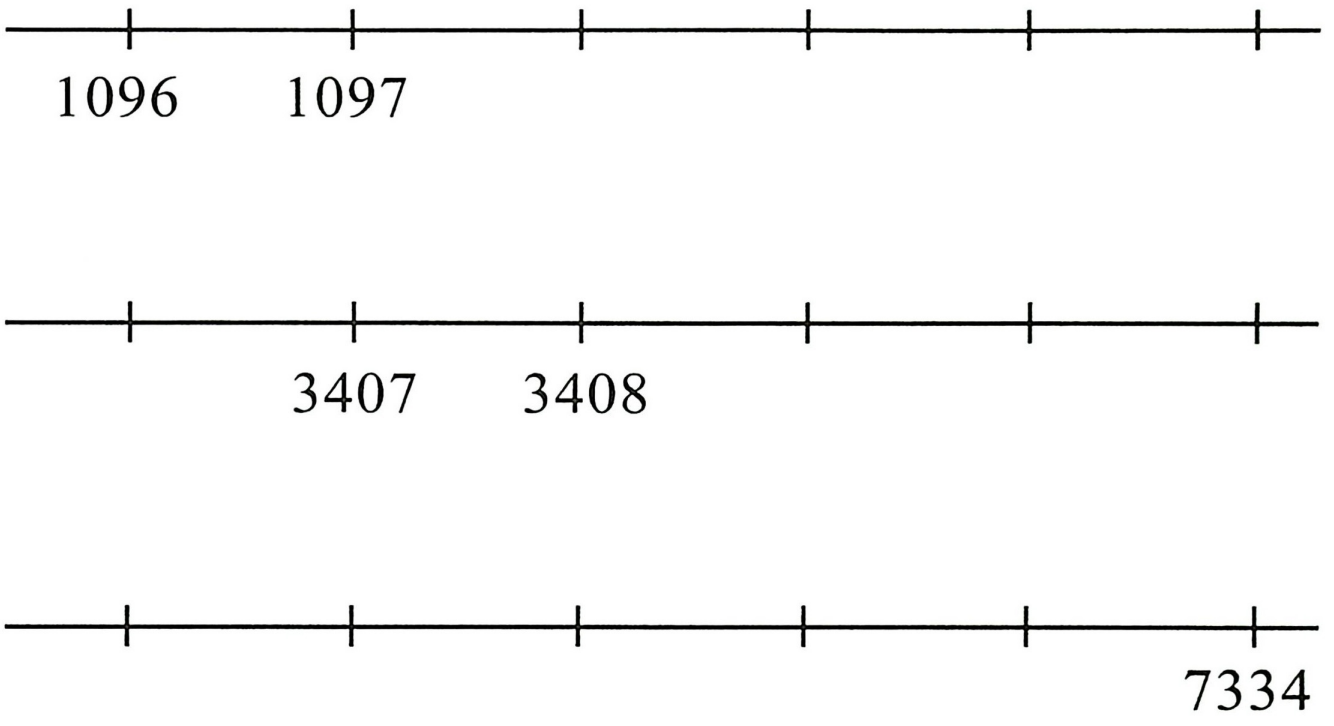
k. Two thousand three hundred twenty

thou-sands	hund-reds	tens	ones

l. Nine thousand thirty-two

thou-sands	hund-reds	tens	ones

5. Fill in the numbers for these number lines.



6. Fill in the number chart, counting by tens.

4010	4020			
4060				

7. Fill in another number chart, counting by tens.

		8680	8690	

Four-Digit Numbers and Place Value

Let's look at the number 2467 in detail.

The 2, 4, 6, and 7 are called the ***digits*** of the number.

Each digit has its own **place** (location) in the number:

- 2 is in the thousands place,
- 4 is in the hundreds place,
- 6 is in the tens place, and
- 7 is in the ones (units) place.

thou-sands	hund-reds	tens	ones
2	4	6	7

2000 + 400 + 60 + 7

Each digit also has a different **value** in the number.

- The value of digit 2 in this number is 2000.
- The value of the digit 4 is 400.
- The value of the digit 6 is 60.
- The value of the digit 7 is just 7.

So, each digit of a number has both a specific place and a specific value. That is why the way we write numbers is called a **place value system**.

The number 2467 is actually the sum (addition) of the values of the digits: it equals 2000 + 400 + 60 + 7.

Examples. Here, each number is written as a sum, according to the places and values of its digits. It is like writing each number out in full, using its parts: the thousands, the hundreds, the tens, and the ones. **Note!** When there are *no* hundreds, tens, or ones, we **write a zero**.

thou-sands	hund-reds	tens	ones
1	0	9	0

1000 + 0 + 90 + 0

thou-sands	hund-reds	tens	ones
5	6	0	2

5000 + 600 + 0 + 2

1. Fill in the blanks.

thou-sands	hund-reds	tens	ones
5	2	5	9

a. 5,000 + _____ + 50 + ____

thou-sands	hund-reds	tens	ones
7	0	8	2

b. 7,000 + 0 + _____ + ____

2. Fill in the blanks, and write each number <u>as a sum</u> of the values of its digits.

a.

thou-sands	hund reds	tens	ones
1	0	3	4

$= \underline{1000} + \underline{0} + \underline{30} + \underline{4}$

b.

thou-sands	hund reds	tens	ones
5	6	7	0

$= ____ + ____ + ____ + ____$

c.

Th	H	T	O
3	5	0	8

$= ____ + ____ + ____ + ____$

d. 8,389 $= ____ + ____ + ____ + ____$

e. 9,007 $= ____ + ____ + ____ + ____$

f. 6,050 $= ____ + ____ + ____ + ____$

g. 216 $= ____ + ____ + ____ + ____$

3. Fill in.

a. Five thousand nine hundred ninety

Th	H	T	O

b. Six thousand sixteen

Th	H	T	O

c. Six thousand three hundred three

Th	H	T	O

d. Eight thousand seven hundred

Th	H	T	O

e. Nine thousand two hundred forty-five

Th	H	T	O

f. Ten thousand

ten thou-sands	Th	H	T	O
1	0	0	0	0