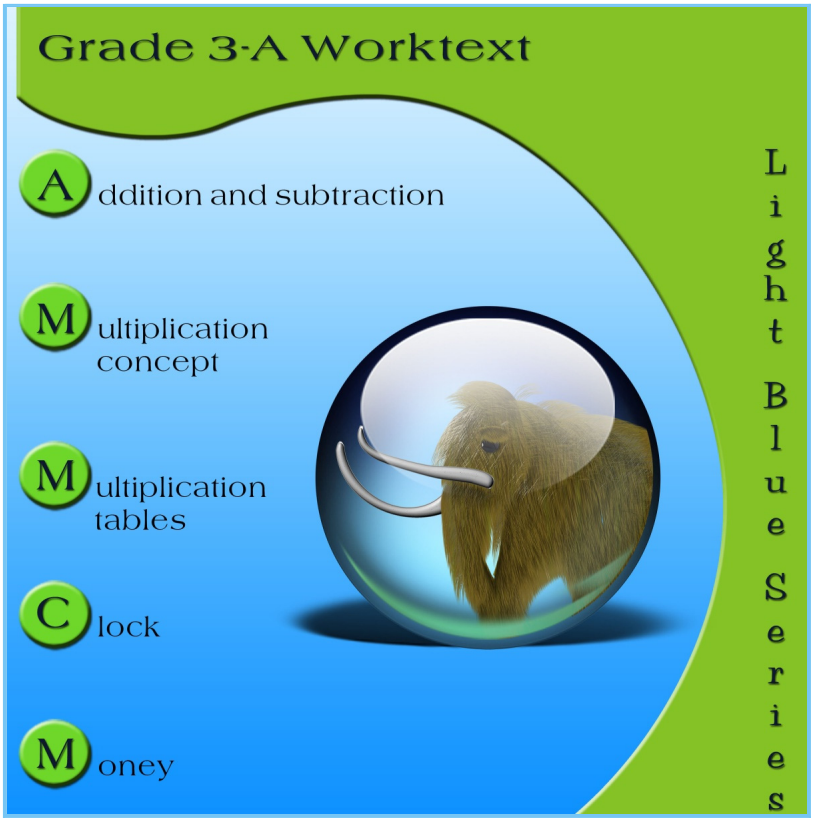
# Math Mammoth
# Grade 3-A Worktext

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# Foreword

Math Mammoth Grade 3 comprises a complete math curriculum for the third grade mathematics studies. The curriculum meets and exceeds the Common Core standards.

The main areas of study in Math Mammoth Grade 3 are:

1. Students develop an understanding of multiplication and division of whole numbers through problems involving equal-sized groups, arrays, and area models. They learn the relationship between multiplication and division, and solve many word problems involving multiplication and division (chapters 2, 3, and 9).
2. Students develop an understanding of fractions, beginning with unit fractions. They compare fractions by using visual models and strategies based on noticing equal numerators or denominators (chapter 10).
3. Students learn the concepts of area and perimeter. They relate area to multiplication and to addition, recognize perimeter as a linear measure (in contrast with area), and solve problems involving area and perimeter (chapter 7).
4. Students fluently add and subtract within 1,000, both mentally and in columns. They also learn to add and subtract 4-digit numbers, and use addition and subtraction in problem solving in many contexts, such as with money, time, and geometry.

Additional topics we study are time, money, measuring, and bar graphs and picture graphs.

This book, 3-A, covers addition and subtraction (chapter 1), multiplication concept (chapter 2), multiplication tables (chapter 3), time (chapter 4), and money (chapter 5). The rest of the topics are covered in the 3-B worktext.

Some important points to keep in mind when using the curriculum:

- The two books (parts A and B) are like a "framework", but you still have a lot of liberty in planning your child's studies. While addition and subtraction topics are best studied in the order they are presented, feel free to go through the sections on shapes, measurement, clock, and money in any order you like.

  This is especially advisable if your child is either "stuck" or is perhaps getting bored with some particular topic. Sometimes the concept the child was stuck on can become clear after a break from the topic.

- Math Mammoth is mastery-based, which means it concentrates on a few major topics at a time, in order to study them in depth. However, you can still use it in a *spiral* manner, if you prefer. Simply have your child study in 2-3 chapters simultaneously. This type of flexible use of the curriculum enables you to truly individualize the instruction for your child.

- Don't automatically assign all the exercises. Use your judgment, trying to assign just enough for your child's needs. You can use the skipped exercises later for review. For most children, I recommend to start out by assigning about half of the available exercises. Adjust as necessary.

- For review, the curriculum includes a worksheet maker (Internet access required), mixed review lessons, additional cumulative review lessons, and the word problems continually require usage of past concepts. Please see more information about review (and other topics) in the FAQ at **https://www.mathmammoth.com/faq-lightblue.php**

I heartily recommend that you view the full user guide for your grade level, available at **https://www.mathmammoth.com/userguides/**

And lastly, you can find free videos matched to the curriculum at **https://www.mathmammoth.com/videos/**

*I wish you success in teaching math!*

*Maria Miller, the author*

# Chapter 1: Addition and Subtraction
## Introduction

This first chapter of *Math Mammoth Grade 3-A* covers a lot of territory. We review and learn more about mental addition and subtraction strategies, review regrouping in addition and subtraction, learn to regroup twice in subtraction, and then study Roman numerals, rounding, the order of operations, and graphs.

Throughout the chapter, students solve lots of word problems and practice some algebra in disguise, where they use a symbol or a *?* for the unknown thing in the problem.

I have included several lessons on mental math, including review of many of the strategies from second grade, so that even students who perhaps did not study mental math strategies in earlier grades can now catch up.

Students also learn and practice regrouping in addition and subtraction. In subtraction, the focus is on regrouping twice and regrouping with zero tens when subtracting three-digit numbers. The lessons illustrate the processes with the help of pictures that relate to base-ten blocks. You can also use physical manipulatives if you prefer. The basic idea of regrouping in subtraction is that a unit gets broken into 10 smaller units: a hundred into 10 tens or a ten into 10 ones, and that is what allows you to subtract. Make sure the student masters this topic.

This chapter also introduces rounding to the nearest ten, and using parentheses with the order of operations as new topics. Then we study the connection between addition and subtraction with bigger numbers, which also aims to help children think algebraically.

Lastly, students get to practice their adding and subtracting skills in a practical way through reading a mileage chart and other types of graphs.

Keep in mind that the specific lessons in the chapter can take several days to finish. They are not "daily lessons." Instead, use the general guideline that third graders should finish 1.5-2 pages daily or 8-10 pages a week. Also, I recommend not assigning all the exercises by default, but that you use your judgment, and strive to vary the number of assigned exercises according to the student's needs.

Please see the user guide at https://www.mathmammoth.com/userguides/ for more guidance on using and pacing the curriculum.

I also offer free videos matched to the curriculum at https://www.mathmammoth.com/videos/.

### The Lessons in Chapter 1


| | page | span |
|---|---|---|
| Mental Addition | 11 | *3 pages* |
| Review: Mental Subtraction | 14 | *3 pages* |
| More Mental Subtraction | 17 | *3 pages* |
| Ordinal Numbers and Roman Numerals | 20 | *3 pages* |
| More Mental Addition | 23 | *3 pages* |
| Mental Subtraction with Three-Digit Numbers | 26 | *3 pages* |

# Mental Addition

Breaking numbers into parts often makes adding easier:

| | | |
|---|---|---|
| 8 + 6 | 30 + 28 | 12 + 60 |
| / \ | / \ | / \ |
| 8 + 2 + 4 = _____ | 30 + 20 + 8 = _____ | 2 + 10 + 60 = _____ |

1. Let's review addition!

| a. | b. | c. | d. |
|---|---|---|---|
| 5 + 8 = _____ | 8 + 7 = _____ | 9 + 9 = _____ | 45 + 5 = _____ |
| 7 + 7 = _____ | 18 + 7 = _____ | 29 + 9 = _____ | 45 + 8 = _____ |
| 8 + 9 = _____ | 58 + 7 = _____ | 69 + 9 = _____ | 45 + 6 = _____ |

2. Break one of the numbers into its tens and ones to make the adding easier:

| | | |
|---|---|---|
| **a.** 50 + 14<br>= *50 + 10 + 4 = 64* | **b.** 80 + 11 | **c.** 50 + 39 |
| **d.** 35 + 60 | **e.** 10 + 5 + 21 | **f.** 29 + 40 + 30 |

3. Add the tens and the ones separately.

| | | |
|---|---|---|
| **a.** 36 + 22<br>= 30 + 20 + 6 + 2<br>= | **b.** 72 + 18<br>= 70 + 10 + 2 + 8<br>= | **c.** 54 + 37<br>= 50 + 30 + 4 + 7<br>= |
| **d.** 24 + 55 | **e.** 36 + 36 | **f.** 42 + 68 |

4. Add the same number each time (repeatedly).

| **a.** Add 20. | **b.** Add 40. | **c.** Add 15. | **d.** Add 25. |
|---|---|---|---|
| *20* | *40* | *15* | *25* |
| *40* | *80* | *30* | *50* |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

If the number you add changes, the *sum* (answer) changes in the *same* way!

| | | |
|---|---|---|
| 56 + 4 = 60 | 17 + 100 = 117 | 15 + 15 = 30 |
| 56 + **5** = **61** | 17 + **99** = **116** | 15 + **17** = **32** |
| 1 more | 1 less | 2 more |

5. Compare each pair of problems as you go:

| **a.** | **b.** | **c.** |
|---|---|---|
| 48 + 20 = _____ | 28 + 100 = _____ | 25 + 25 = _____ |
| 48 + 21 = _____ | 28 + 99 = _____ | 25 + 27 = _____ |
| **d.** | **e.** | **f.** |
| 200 + 36 = _____ | 36 + 40 = _____ | 46 + 50 = _____ |
| 199 + 36 = _____ | 36 + 39 = _____ | 46 + 47 = _____ |
| **g.** | **h.** | **i.** |
| 220 + 50 = _____ | 270 + 30 = _____ | 670 + 20 = _____ |
| 227 + 50 = _____ | 270 + 32 = _____ | 669 + 19 = _____ |

6. Add. Find the easiest order to add! You can break numbers into their parts and add part-by-part.

| | | |
|---|---|---|
| **a.** 20 + 40 + 2 + 7<br>= _____ | **b.** 30 + 50 + 8 + 2<br>= _____ | **c.** 40 + 60 + 4 + 3<br>= _____ |
| **d.** 10 + 12 + 7 + 3<br>= _____ | **e.** 52 + 4 + 30 + 3<br>= _____ | **f.** 78 + 10 + 2 + 20<br>= _____ |

7. Draw a line to connect each problem to its answer.

| | | |
|---|---|---|
| 29 + _____ = 36 | 7 | 86 + _____ = 96 |
| 66 + _____ = 76 | 10 | 46 + _____ = 56 |
| 48 + _____ = 56 | 9 | 57 + _____ = 66 |
| 50 + _____ = 56 | 6 | 38 + _____ = 46 |
| 87 + _____ = 96 | 8 | 89 + _____ = 96 |
| 70 + _____ = 76 | | 39 + _____ = 46 |
| 68 + _____ = 76 | | 77 + _____ = 86 |

**Puzzle Corner**

Solve the mystery numbers △ and □!
(Guess and check.)

**a.**

△ + △ + 1 = 15

△ = _____

**b.**

□ + △ = 11

□ – △ = 5

△ = _____

□ = _____

**c.**

□ + △ = 17

□ + □ = 14

△ = _____

□ = _____

# Review: Mental Subtraction

1. Practice basic subtraction facts with this drill! Point to the problem and think of the answer.

| a. | b. | c. | d. | e. |
|---|---|---|---|---|
| 12 – 5 | 13 – 8 | 14 – 5 | 15 – 6 | 16 – 7 |
| 12 – 7 | 13 – 4 | 14 – 7 | 15 – 8 | 16 – 9 |
| 12 – 8 | 13 – 5 | 14 – 9 | 15 – 9 | 16 – 8 |
| 12 – 6 | 13 – 6 | 14 – 6 | 15 – 7 | |
| 12 – 4 | 13 – 9 | 14 – 8 | | f. |
| 12 – 9 | 13 – 7 | | | 17 – 8 |
| 12 – 3 | | | | 17 – 9 |

**<u>Strategy 1:</u> Use known subtraction facts**

Since 14 – 6 = 8, we know that the answer to 74 – 6 will end in 8, but it will be in the sixties (sixty-something). So it is 68.

Since 15 – 8 = 7, we know that the answer to 55 – 8 will end in 7, but it will be in the forties (forty-something). So it is 47.

2. Subtract.

| | | |
|---|---|---|
| **a.** 14 − 5 = _____ | **b.** 12 − 8 = _____ | **c.** 15 − 6 = _____ |
| 54 − 5 = _____ | 92 − 8 = _____ | 35 − 6 = _____ |

3. Subtract and compare the results!

| a. | b. | c. | d. |
|---|---|---|---|
| 14 − 7 = _____ | 12 − 8 = _____ | 16 − 7 = _____ | 15 − 7 = _____ |
| 34 − 7 = _____ | 42 − 8 = _____ | 56 − 7 = _____ | 75 − 7 = _____ |
| 64 − 7 = _____ | 82 − 8 = _____ | 156 − 7 = _____ | 675 − 7 = _____ |

# Using the Half-Dollar

| | | | | |
|---|---|---|---|---|
| <br>This is a **half-dollar**.<br>It is worth 50 cents. | <br>a quarter<br>_____¢ | <br>a dime<br>_____¢ | <br>a nickel<br>_____¢ | <br>a penny<br>_____¢ |
| <br>A half-dollar is worth two quarters, because 50 = 25 + 25. | <br>A half-dollar and a quarter is 75 cents. | <br>A half-dollar and two quarters make $1. | | |

1. Half-dollars and quarters. Write the total amount in cents.

| | | |
|---|---|---|
| <br>**a.** _____ ¢ | <br>**b.** _____ ¢ | <br>**c.** _____ ¢ |
| <br>**d.** _____ ¢ | <br>**e.** _____ ¢ | |

2. Write how many half-dollars and how many quarters you need to make these amounts.

| | | | |
|---|---|---|---|
| **a.** 150 cents<br>_____ half-dollars | **b.** 200 cents<br>_____ half-dollars | **c.** 150 cents<br>_____ quarters | **d.** 75 cents<br>_____ quarters |
| **e.** 175 cents<br>_____ half-dollars ***and*** _____ quarter(s) | | **f.** 225 cents<br>_____ half-dollars ***and*** _____ quarter(s) | |

**Count up, starting with the coin(s) with the most value.**

100¢

125¢



127¢

50¢

100¢

105¢

Count two quarters as fifty.

3. How much money? Write the amount in cents.

**a.** _____¢

**b.** _____¢

**c.** _____¢

**d.** _____¢

**e.** _____¢

**f.** _____¢

**g.** _____¢

**h.** _____¢

**i.** _____¢

**j.** _____¢