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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

Helpful Resources on the Internet

Use these free online resources to supplement the "bookwork" as you see fit.

MENTAL MATH

Puzzle Worksheets
This site offers printable number grid puzzle worksheets in three difficulty levels: easy, moderate, and hardest. The "hardest" are actually the best ones — the "easy" ones may be too easy for this level. The puzzles practice mental addition and subtraction within 100.
http://www.dadsworksheets.com/worksheets/number-grid-puzzles-addition-and-subtraction-with-missing-values-to-100.html

Callum's Addition Pyramid
Add the pairs of numbers to get a number on the next level and finally the top number.
Three difficulty levels.
https://web.archive.org/web/20170627025157/http://www.amblesideprimary.com/ambleweb/mentalmaths/pyramid.html

Random Coins
Can you make $1.00 from Random Coins? Drag and drop the coins.
https://www.mathsisfun.com/money/random-coins.html

Math Mahjong Subtraction
Play a mahjong game—subtraction version.
http://www.sheppardsoftware.com/mathgames/mahjong/mahjong_subtraction.htm

Monkey Drive Subtraction Up to 25
Drive through the barrels with numbers whose difference matches the number on your car.
http://www.sheppardsoftware.com/mathgames/monkeydrive/subtraction/MDSubtract25.htm

Puzzle Pics Subtraction
Click the tile with the right answer and a secret picture is revealed.
http://www.mathplayground.com/puzzle_pics_subtraction.html

REGROUPING

Mr. Martini's Classroom: Long Addition
Practice regrouping in addition online. Click the x's to set the number of digits in the problems.
http://www.thegreatmartinicompany.com/longarithmetic/longaddition.html

Tic Tac Toe Addition
Solve three-digit addition problems while playing tic-tac-toe.
http://www.funbrain.com/cgi-bin/ttt.cgi?A1=s&A2=11&A3=0

Subtraction by Splitting
Subtract numbers by "splitting" them—this shows how regrouping works. Choose the medium or advanced level.
http://www.bbc.co.uk/skillswise/game/ma09subt-game-subtraction-by-splitting

3-Digit Subtraction with Regrouping
Solve 3-digit subtraction problems with step-by-step guidance.
http://www.softschools.com/math/subtraction/3_digit_subtraction/3_digit_subtraction_with_regrouping/

Bowling Game
Solve 10 subtraction problems. After each problem, you get to bowl.
http://www.learnalberta.ca/content/me3us/flash/lessonLauncher.html?lesson=lessons/07/m3_07_00_x.swf

Triple-Digit Subtraction Card Game
An easy card game with several variations to practice double and triple-digit subtraction.
http://www.mathgamesandactivities.com/tag/math-games-that-involve-regrouping/

How Close Can You Get?
See how close you can get to the target number in this fun subtraction card game for the whole family.
http://motionmathgames.com/3-subtraction-activities-for-family-fun-night/

ROMAN NUMERALS

Roman Numerals Game
Arrange the letters to make the Roman numeral that matches the given number, and repair broken columns.
http://www.abcya.com/roman_numerals.htm

Concentration — Roman Numerals
Practice Roman numerals from 1 to 100 with this simple concentration game.
https://www.quia.com/cc/2186108.html

Roman Numerals Tutorial
Simple explanations of how numbers are formed using Roman numerals, such as when to "add" or "subtract" the symbols. The student can self-check his/her understanding.
http://www.beaconlearningcenter.com/weblessons/romannumerals/default.htm

Roman Numerals Worksheets
Generate worksheets for converting Roman numerals to normal (Arabic) ones, or normal numbers to Roman numerals, or do easy addition and subtraction problems with Roman numerals.
http://www.homeschoolmath.net/worksheets/roman_numerals.php

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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

> **Strategy 1:   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 = _____

Strategy 4:   Add.

You can "add backwards". This works well if the two numbers are close to each other.

Instead of subtracting, think how much you need to add to the number being subtracted (the subtrahend) in order to get the number you are subtracting from (the minuend).

$71 - 67 = ??$	$558 - 556 = ??$
Think: $67 +$ ☐ $= 71$	Think: $556 +$ ☐ $= 558$

6. Subtract.

a. $78 - 75 =$ _____	**b.** $112 - 108 =$ _____	**c.** $505 - 499 =$ _____
$61 - 58 =$ _____	$692 - 688 =$ _____	$1000 - 994 =$ _____

7. You had $50. You purchased two bouquets of roses for $13 each.
   How much do you have left after the purchase?

8. What if you bought <u>three</u> bouquets of roses for $13 each with your $50?
   How much would you have left after the purchase?

9. Fifteen children were playing on the playground. Seven of them left.
   Then, ten more children came. How many are playing on the playground now?

10. A lion chased an antelope for 400 feet, then another 200 feet, and
    lastly 200 feet more. Then the lion pounced on the antelope.
    What was the total number of feet that the lion chased the antelope?

What is this three-digit number? The tens digit is half of 10.
The hundreds digit is double the ones digit. And the ones digit
is half the amount of letters in the word "June."

That was the easy puzzle. Now comes the real one.

What is this three-digit number?
Here are the clues for the digits: September, October, November.

PUZZLE CORNER

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Chapter 2: Multiplication Concept
Introduction

The second chapter of *Math Mammoth Grade 3-A* covers the concept of multiplication. Memorizing and drilling the times tables is in the following chapter, chapter 3.

The first lessons introduce the concept of multiplication as repeated addition of groups of the same size. *Multiplication on a Number Line* illustrates repeated addition as consecutive jumps or skips on a number line. The student learns to connect skip-counting with multiplication.

Then, the lesson *Multiplication as an Array* shows a different model for multiplication: objects arranged in rows and columns. This lesson teaches the student to think of the rows as groups, showing the fundamental unity of the two models. The whole lesson is presented in pictures.

The order of operations is studied in two lessons. In the first one, students learn that multiplication is to be done before addition or subtraction and that addition and subtraction are to be done from left to right. Later, in the second lesson, we also use parentheses.

Understanding Word Problems shows how multiplication problems involve the idea of "each," "every," or "all." For example, *each* item has the same number of something. If students find these problems difficult, they can draw pictures to help, such as drawing flowers in pots, slices of pizza, *etc.*

Understanding Word Problems, Part 2 has problems that are more challenging. The word problems in traditional textbooks are often so easy that children learn just to take the numbers in the problem and mechanically apply the operation that the lesson is about without really understanding what they are doing. If this lesson is too difficult, skip it for the time being and come back to it later. Drawing a picture for each problem can help.

Multiplication in Two Ways focuses on the thought that it does not matter in which order the factors appear (the commutative property of multiplication). Objects in an array illustrate this fact nicely: either the row or the column can be taken as the group being multiplied.

Multiplying by Zero is illustrated both with the group model (either several groups of zero size or zero groups of any size) and with the jump-on-a-number-line model (either several jumps of zero distance or zero jumps of any distance).

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.

The Lessons in Chapter 2

Helpful Resources on the Internet

Use these free online resources to supplement the "bookwork" as you see fit.

Under the Sea Board Game
Roll two dice to find the number of groups and the number of items in each group. Then drag the blue circle to show the corresponding array on a grid, and your piece will move on the board.
http://www.learnalberta.ca/content/me3us/flash/lessonLauncher.html?lesson=lessons/08/m3_08_00_x.swf

Match Multiplication Arrays
Match each multiplication fact to the correct array, pictured by dots.
https://www.studyladder.com/resources/activity/fullscreen?id=20521

Gordon's Multiplication
Click on a picture to give a context to a multiplication question. Choose either problems that show the answer or problems where you work out the answer.
http://www.topmarks.co.uk/Flash.aspx?f=multiplication

Multiplication Array Frame
Fill in the multiplication sentences to match the arrays shown.
http://www.snappymaths.com/multiplication/earlymult/interactive/arrays/arraysframe.htm

Carl's Cookie Capers
Multiplication problems with pictures. Choose level 1.
http://www.multiplication.com/games/play/carls-cookie-capers

Camel Times Tables
Easy multiplication questions to solve, illustrated with pictures.
http://www.bbc.co.uk/bitesize/firstlevel/mathematics/multiplication/play/

Multiplication Number Lines
Click on a square in the multiplication grid to get a problem. Then click on the square after the equals sign to see the problem illustrated on a number line.
http://www.ictgames.com/multinumberlines.html

Multiplication Memory Game
Click on corresponding pairs (the problem and its answer).
http://www.maths-on-the-net.com/fileadmin/flash_eng/getAufgabe.php?anr=2&typ=s2&seite=0&variante=12

Fish Shop Multiplication
Choose "easy", then a few tables to practice (such as tables of 1, 2, and 3). Solve easy multiplication questions while serving customers in a fish shop.
http://www.multiplication.com/games/play/fish-shop-multiplication

Math Wash Up
Help the window washer wash his way to the very top of the skyscraper. Choose level 0-5.
http://www.multiplication.com/games/play/math-wash

Under the Sea Multiplication Activities
Practice various topics related to the concept of multiplication. Finish all the topics to unlock a treasure!
http://www.learnalberta.ca/content/me3us/flash/index.html?goLesson=8&launch=true

Math Dice Game for Addition and Multiplication
Instructions for three simple games with dice: one to learn the concept of multiplication, another to practice the times tables, and one more for addition facts.
http://www.teachingwithtlc.blogspot.com/2007/09/math-dice-games-for-addition-and.html

Math Word Problems: Fun With Animals
A set of five word problems with mixed operations to solve.
http://www.syvum.com/cgi/online/fillin.cgi/kwps1/ksmat6b.tdf?0

Bracket Basics
Drag the numbers to the correct spaces to make a problem that will equal the target number.
http://www.bracketbasics.co.uk/activity/

Free worksheets for the Order of Operations
Generate printable and customizable worksheets for order of operations. Choose from five operations and parentheses. You can choose the number range used, number of problems, and more.
http://www.homeschoolmath.net/worksheets/order_of_operations.php

Button Beach Challenge
Figure out what number the various colored buttons represent.
https://web.archive.org/web/20170626213437/http://www.amblesideprimary.com/ambleweb/mentalmaths/buttons.html

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Multiplication as an Array

An **array** is an orderly arrangement of things in rows and columns.
When things are neatly aligned in an array, we can think of the <u>*rows as groups*</u>,
so an array still pictures multiplication as repeated addition.
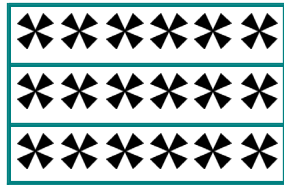
3 rows, 6 crosses in each row.

$$6 + 6 + 6$$

$$3 \times 6 = 18$$
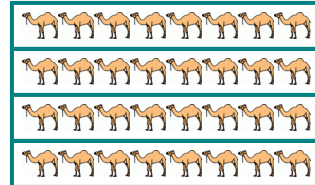
4 rows, 8 camels in each row.

$$8 + 8 + 8 + 8$$

$$4 \times 8 = 32$$

1. Fill in the missing numbers.

a. _____ rows, _____ carrots in each row.

_____ + _____

_____ × _____ = _____ carrots
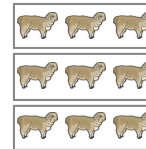
b. _____ rows, _____ rams in each row.

_____ + _____ + _____

_____ × _____ = _____ rams

c. _____ rows, _____ bear in each row.

_____ + _____

_____ × _____ = _____ bears
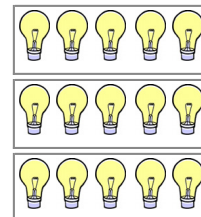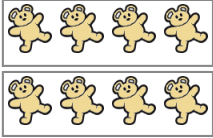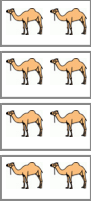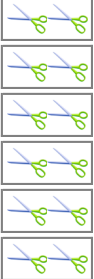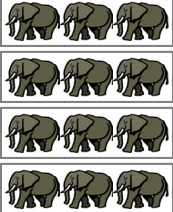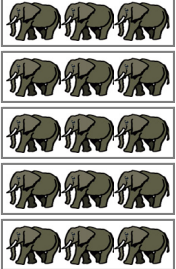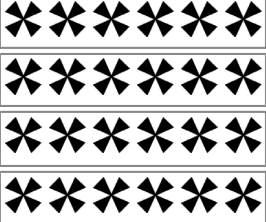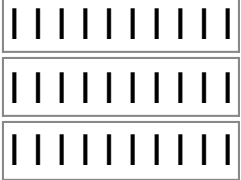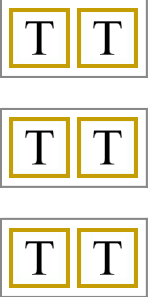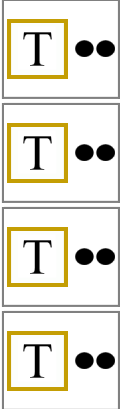
d. _____ rows, _____ bulbs in each row.

_____ + _____ + _____

_____ × _____ = _____ bulbs

2. Write the addition and multiplication facts that the pictures are illustrating.
   The box with a "T" is a ten.

a.

$4 + 4 =$ _____

$2 \times 4 =$ _____

b.

c.

d.

e.

f.

g.

h.

i.

j.

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Chapter 3: Multiplication Tables
Introduction

In the third chapter we concentrate on memorizing the times tables. This chapter includes lots of repetition, drill, and practice. Therefore, you are welcome to mix the lessons from this chapter with lessons from the chapters on geometry, place value, clock & time, or measuring, in order to prevent boredom. For example, the student could study time (chapter 4) and topics of this chapter each day, or study the two different chapters on alternate days. This is not compulsory but just a suggestion to "mix things up" in a somewhat spiral fashion.

I also provide free videos for the study of the multiplication tables at
https://www.mathmammoth.com/videos/multiplication_tables.php

Tips for Effective Oral Drilling

When you are doing memorization drills, be sure to explain to the student that the goal is to *memorize* the facts—to recall them from memory—and not to get the answers by counting or any other method. Just as your child has probably already memorized your address and phone number, now she or he is going to memorize some math facts. You can easily see if the student is trying to count, because producing the answer by counting takes much more time. You should expect the child to answer fairly quickly when you are drilling. If the child doesn't know the answer by heart, then tell the child the right answer.

Short drill sessions are usually best. For example, you might drill for five or ten minutes at a time, depending on the attention span of the child.

However, try to have at least two sessions during the day as your schedule permits. Scientific research about how the brain learns has shown that new memories are forgotten soon, and that new information is best retained when it is reviewed *within 4-6 hours* of the time it is initially learned. (This principle applies to anything new that a person is learning.)

Pencil and paper activities alone do not work well for memorizing facts because the child can get the answers by counting and not from memory. Proper drill requires an investment in time from the instructor. If you can, have older siblings help with the task of drilling. Moreover, computers are great drillmasters; they never get tired or bored and you can usually choose a timed session in which the child must produce the answers quickly. Computer-based drilling can be very rewarding to children when they notice that they are truly learning the facts and are able to complete the drills successfully. They can actually come to enjoy the process of memorization. I have included a list of free online multiplication activities at the end of this introduction.

Here is a five-step method for memorization. Normally, only a few of the steps would be included in any one session, depending on the child's concentration and ability.

Structured Drilling of the Table of 3—in steps

Write on paper or on the board the times table to be learned. We will use the table of 3 as an example. You can view a video explaining the main points of the drill here:
https://www.mathmammoth.com/lessons/multiplication_tables.php

1. The first task is to memorize the list of <u>answers</u>. Have the student study the first half of the skip-counting list (3, 6, 9, 12, 15, 18), saying the numbers aloud while pointing to the answers one by one with their finger or a pen. You may also use a number line. This technique uses the senses of seeing, hearing, and touch simultaneously to fix the information in the brain.

$1 \times 3 = 3$
$2 \times 3 = 6$
$3 \times 3 = 9$
$4 \times 3 = 12$
$5 \times 3 = 15$
$6 \times 3 = 18$
$7 \times 3 = 21$
$8 \times 3 = 24$
$9 \times 3 = 27$
$10 \times 3 = 30$
$11 \times 3 = 33$
$12 \times 3 = 36$

   After the student has gone through the list a few times, ask him or her to repeat it from memory. Expect the student to answer, and don't give the answers too easily, because only by putting forth an effort will the student memorize the facts. The same as the muscles, the mind needs exercise to become stronger.

   Require the student to memorize the skip-counting list both forwards and backwards. Keep practicing until he or she can easily recite the first list of 3, 6, 9, 12, 15, 18. With some tables, such as the tables of 2, 5, and 10, it helps to point out the pattern in them. The pattern in the table of 9 is more subtle but still useful.

2. Tackle the last half of the list: 21, 24, 27, 30, 33, 36. Do the same things you did with the first half of the list.

3. Next, work with the entire list of answers. Practice the list counting up *and* down until it goes smoothly and easily. These steps may be enough for one session, but *be sure to review* again later in the day.

4. In this stage, the goal is to associate each answer 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, with a certain multiplication fact (such as 7×3). So, keep the whole table visible (without the answers) and practice individual problems randomly by pointing to them. Ask orally ("What is 5 times 3?"), while pointing to the problem—again, using both the sense of hearing and seeing (multiple senses).

5. The next step is to do this the other way around. Now *you* say the answer ("21"), and the student has to produce the problem ("3 × 7"). Keep the table handy, but hide the *problems* from sight, and point to the answers in a random order.

   This technique can also work the other way around, where the child says the answers, and you produce the problems. Be sure to give wrong multiplication facts occasionally to check the student's accuracy.

   As an optional extension, you can say answers from several tables that you have studied, and the student gives the corresponding problem. Sometimes there are several answers. For example, 36, 30, 24, and 20 are in several different times tables. This is an especially good exercise as it prepares for the concepts of division and factoring.

6. The last step is totally random drilling using flash cards, oral problems, or computer programs.

The memorization probably will not happen overnight. On subsequent days, you can mix steps 1-5 (normally you will not need to concentrate too much on steps 1 and 2 after the initial practice). This kind of drilling takes a little time and effort from the teacher, but it can be very effective. You might also be able to do some of the practice while going about other tasks, such as traveling in the car.

Another tip is to try to teach the process to the student, so that he or she will learn how to do the memorization on his or her own, hiding the answers and trying to reproduce the list in the mind.

Other helpful ideas

- Hang a poster with the 12×12 or 10×10 table on the wall. Remind your child to glance at it a few times a day. It can work wonders for students who learn best by visualizing things!

- Hang another poster beside it, with an empty grid, in which the child fills in the facts he has mastered.

- Recite the skip-counting lists or multiplication facts aloud just before going to bed. This can turn them into mastered facts by the next morning.

Are timed drills necessary?

I feel that timed drills are just one tool among many when it comes to learning math facts. Some children will thrive on them. Perhaps they like the challenge of racing against the clock. Timed computer games can work very well for drilling facts (for example the games at http://www.sheppardsoftware.com/math.htm).

For other children, timed drills may be counterproductive and end up in tears and frustration. Try them and see how it goes. Use your your judgment as to their usefulness as a learning tool.

Should one table be memorized before going on to the next?

The basic idea is to stay on one table until it is mastered. That can take a varying amount of days depending on the child, the number of practice sessions, and other constraints on the child's time. It is best to practice each table at least two times a day (because the brain will memorize things much quicker that way), but each session doesn't have to take a long time.

However, the child can study other math topics, such as geometry, measuring, addition, or clock, at the same time, as long as these other topics do not rely heavily on multiplication tables (division does).

Also, incorporate games to keep the learned facts fresh in their mind. The old idiom "use it or lose it" comes into play here. As the student masters more facts, he or she will probably enjoy playing a variety of multiplication games.

The Lessons in Chapter 3

Helpful Resources on the Internet

You can use these free online resources to supplement the "bookwork" as you see fit.

Multiplication Tables - Structured Drill Videos
A series of videos by the author to help children learn the multiplication tables. Each video lesson teaches and practices a particular skip-counting pattern, then the corresponding multiplication table, and lastly the table backwards. The series also includes "interludes" - short videos with multiplication patterns, puzzles, and word problems.
https://www.mathmammoth.com/videos/multiplication_tables.php

How to Help Students with Multiplication Tables
An article and video of mine explaining how to do a "structured drill" for the multiplication tables.
https://www.mathmammoth.com/lessons/multiplication_tables.php

Learn 'Em Forwards and Backwards
An online multiplication facts trainer that uses the same sequence for learning the tables as Math Mammoth.
http://mathwithoutborders.com/learn-em-forwards-and-backwards

Multiplication Worksheets
Regular, printable multiplication worksheets for the multiplication tables.
https://www.homeschoolmath.net/worksheets/grade3/multiplication.php

A list of multiplication games
Improve your multiplication skills with these fun games!
http://www.multiplication.com/games/all-games

Math Trainer - Multiplication
Reinforce multiplication skills and focus on improving weaknesses in this multiplication workout that responds to your answers.
http://www.mathsisfun.com/numbers/math-trainer-multiply.html

Table Mountain
Climb the mountain with 20 questions from a selected table.
http://www.teachingtables.co.uk/tm/tmgame/tgame2.html

Math Dice Game for Addition and Multiplication
Instructions for three simple games with dice; one to learn the concept of multiplication, another to practice the times tables, and one more for addition facts.
http://www.teachingwithtlc.blogspot.com/2007/09/math-dice-games-for-addition-and.html

Cone Crazy—Flurry of Flavors
Practice multiplication facts while serving ice cream to customers. You can choose which tables you want to practice.
http://www.multiplication.com/games/play/flurry-flavors

Multiplication Snake
Move the snake so that it "eats" the answers to the given multiplication problems. You can choose which tables you want to practice.
http://www.mathplayground.com/multiplication_snake.html

Fruit Shoot Multiplication
Click the fruit with the correct answer to the given multiplication problem. You can choose which tables to practice.
http://www.sheppardsoftware.com/mathgames/fruitshoot/fruitshoot_multiplication.htm

Times Tables Grid
Find the answers in the grid.
http://www.bbc.co.uk/skillswise/game/ma13tabl-game-tables-grid-find

Meteor Multiplication
Shoot the meteor with the matching multiplication problem.
http://www.arcademics.com/games/meteor/meteor.html

Balloon Pop Math — Multiplication Level 1
Pop the balloons in the ascending order of the answers.
http://www.sheppardsoftware.com/mathgames/numberballoons/NumberBalloons_times_level1.htm

Clear It Multiplication
Click on number tiles that, when multiplied, give the target number. Your aim is to clear the board!
http://www.abcya.com/clear_it_multiplication.htm

Multiplication Blocks
Find the numbers, when multiplied, equal the target number, while trying to clear the board of blocks.
http://www.mathplayground.com/multiplication_blocks.html

Multiplication Word Problems: Fun with Animals
Solve five word problems and get your score.
http://www.syvum.com/cgi/online/fillin.cgi/kwps1/ksmat4b.tdf?0

Multiplication Facts Quiz Game
Select the matching pairs of cards with multiplication problems from the tables of 6, 7, 8, and 9.
http://quizhub.com/quiz/free/f-multiply.cfm

Factor Family Reunion
Make sure the members of the factor families are seated at the correct table. Practices missing factors.
http://mrnussbaum.com/factor-family-reunion-2/

Multiples Frenzy
Find and click on multiples of the number picked as they appear on the screen.
http://www.sheppardsoftware.com/mathgames/multiple/multiple_frenzy.htm

Acing Math (PDF)
A large collection of math games for grades K-6 that you can play with a standard deck of cards.
http://www.pepnonprofit.org/uploads/2/7/7/2/2772238/acing_math.pdf

Raging Rectangles and Multiple Madness (PDF)
Dozens of printable board games for multiplication, division, and other third grade math topics. Check out especially the games Raging Rectangles on page 8, and Multiple Madness on page 9.
http://maccss.ncdpi.wikispaces.net/file/view/3rdgrade_GAMES_3.21.14.pdf

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Multiplication Table of 3

1. Skip-count by threes. Practice this pattern until you can say it from memory. Also practice it backwards (up-down). You may practice one-half of it at first, and the other half later.

    0, 3, _____, _____, _____, _____, _____, _____, _____, _____, _____, _____, 36

2. **a.** Fill in the table of 3. **b.** Fill in the missing factors. Then cover the answers. Choose problems in random order and practice. You may first practice only the part from 1×3 till 6×3, and the rest at a later time, such as the next day.

a.

$1 \times 3 = $ ____	$7 \times 3 = $ ____
$2 \times 3 = $ ____	$8 \times 3 = $ ____
$3 \times 3 = $ ____	$9 \times 3 = $ ____
$4 \times 3 = $ ____	$10 \times 3 = $ ____
$5 \times 3 = $ ____	$11 \times 3 = $ ____
$6 \times 3 = $ ____	$12 \times 3 = $ ____

b.

____ $\times 3 = 3$	____ $\times 3 = 21$
____ $\times 3 = 6$	____ $\times 3 = 24$
____ $\times 3 = 9$	____ $\times 3 = 27$
____ $\times 3 = 12$	____ $\times 3 = 30$
____ $\times 3 = 15$	____ $\times 3 = 33$
____ $\times 3 = 18$	____ $\times 3 = 36$

Note: the fact $2 \times 3 = 6$ or $3 \times 2 = 6$ is in both the table of three and the table of two.

3. Don't write the answers down. Use these problems for random drill practice.

6×3	7×3	3×3	3×7	3×8
9×3	2×3	3×11	3×4	3×3
4×3	8×3	3×9	3×6	3×5
3×1	12×3	3×12	8×3	10×3

4. Don't write the answers down. Use these problems for random drill practice.

$\square \times 3 = 15$	$\square \times 3 = 12$	$\square \times 3 = 27$	$\square \times 3 = 36$	$\square \times 3 = 30$
$\square \times 3 = 33$	$\square \times 3 = 36$	$\square \times 3 = 33$	$\square \times 3 = 3$	$\square \times 3 = 6$
$\square \times 3 = 9$	$\square \times 3 = 24$	$\square \times 3 = 27$	$\square \times 3 = 18$	$\square \times 3 = 21$

5. Continue the patterns.

a.

12 × 2 = _____

13 × 2 = _____

14 × 2 = _____

_____ × _____ = _____

_____ × _____ = _____

_____ × _____ = _____

_____ × _____ = _____

_____ × _____ = _____

_____ × _____ = _____

_____ × _____ = _____

b.

1 × 2 − 1 = _____

2 × 2 − 2 = _____

3 × 2 − 3 = _____

_____ × _____ − _____ = _____

_____ × _____ − _____ = _____

_____ × _____ − _____ = _____

_____ × _____ − _____ = _____

_____ × _____ − _____ = _____

_____ × _____ − _____ = _____

_____ × _____ − _____ = _____

6. Solve the word problems.

a. John takes care of his neighbor's cat when the neighbor is away.
He earns $3 each day. John wants to buy a toy train that costs $14.
How many days will he have to work so he can buy it?

b. John took care of the cat for five days. Then his Grandpa gave him
$5 as a present. How much money does John have now?

So, he bought the 14-dollar train. How much money does he have left now?

c. John has $6. Then he takes care of the neighbor's cat for four days. Does he
now have enough money to buy a book about nesting birds that costs $16?

d. Roses are sold in bunches of three. Dad bought eleven bunches and one extra rose for Mom's birthday—a rose for each year. How old is Mom?

e. How many bunches of roses and extra roses would Dad need to buy if Mom was 31 years old?

f. How about *your* mom? How many bunches of roses and extra roses would you need to buy for your mom?

7. Fill in the parts of the multiplication table that we have studied.

×	0	1	2	3	4	5	6	7	8	9	10	11	12
0													
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

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Chapter 4: Telling Time
Introduction

This chapter covers reading the clock to the minute, finding time intervals (elapsed time), and using the calendar.

We review the topic of reading the clock to the five-minute intervals, first using numbers in telling the time, such as 6:45 or 12:15. Then, children learn about quarter hours, such as a quarter till 6 or a quarter past 9. We also review the topic of using "past" and "till", such as in 20 till 6 or 10 past 11.

Next, we study elapsed time in the lessons *How Many Minutes Pass* and *More on Elapsed Time*. These lessons provide lots of visual aids (clock faces) for the children to be able to figure out how much time passes. You can also use a practice clock. The lessons don't yet cover the situation where we would need to figure out the elapsed time in several parts (such as, how much time passes from 9:13 AM to 1:45 PM?). That is studied in 4th grade.

The lesson *Clock to the Minute* completes the topic (begun in earlier grades) of reading the clock, because the student will now be able to tell the complete time. From that point on, the focus switches to finding time intervals and other time-related calculations.

We revisit elapsed time briefly for one lesson. This time the starting/ending times are not restricted to five-minute intervals.

Lastly, students practice using the calendar for one lesson, and then it is time for review.

The Lessons in Chapter 4

Helpful Resources on the Internet

Use these free online resources to supplement the "bookwork" as you see fit.

Analog Clock
An interactive clock that you can use to demonstrate elapsed time.
https://web.archive.org/web/20180217121158/http://www.amblesideprimary.com/ambleweb/mentalmaths/clock.html

Interactive Teaching Clock
Play around with the controls—you can do all kinds of demonstrations with this clock!
http://www.visnos.com/demos/clock

Flashcard Clock
Read the analog clock and type in the time in digital format.
http://www.teachingtreasures.com.au/maths/FlashcardClock/flashcard_clock.htm

ClockWorks
Choose "advanced" level for 3rd grade practice. Move the hands of the clock to the given time by clicking on the tick marks on the clock.
http://mrnussbaum.com/clockworks/

Stop the Clock 4!
Drag the five digital times to the correct analog clocks, and then press STOP THE CLOCK button.
http://coolsciencelab.com/stop_the_clock_difficult.html

Bang On Time
Read the time in words and then stop the clock when the hands are in the matching position.
http://web.archive.org/web/20160419113705/http://www.oswego.org/ocsd-web/games/bangontime/clockwordres.html

Matching Pairs: Time
A matching game—choose "5 minute intervals" for this grade level.
http://www.topmarks.co.uk/Flash.aspx?f=matchingpairstimev3

On Time
Click and drag the hands of the clock to the correct time. This can be challenging!
http://www.sheppardsoftware.com/mathgames/earlymath/on_time_game4.swf

Quarter Hours Interactive Mad Math
Write the time shown on the analog clock. Includes "quarter to" and "quarter past".
http://www.snappymaths.com/other/measuring/time/interactive/quarterhours/quarterhoursimm/quarterhoursimm.htm

Time Matching Game
Match the analog clocks with the correct English phrases.
http://www.math-play.com/time-matching-game.html

That Quiz: Time
Online quizzes for reading the clock, time passed, adding/subtracting with time, conversion of time units, and time zones. The quizzes have many levels, can be timed or not, and include lots of options.
http://www.thatquiz.org/tq-g/math/time

Time-for-time
Resource site to learn about time: worksheets, games, quizzes, and time zones.
http://www.time-for-time.com/default.htm

ELAPSED TIME

Clock - an Interactive Whiteboard Resource
An analog clock which demonstrates elapsed time, time in words, the 12-hour clock and 24-hour clock. You can also click on "digital" to view a digital clock alongside the analog clock
http://www.wmnet.org.uk/files/clock.swf

Elapsed Time
Click "New Time". Then click the buttons that advance the time on the clock, until the time matches the "End" time. Choose difficulty levels 1 and 2 for this grade level.
http://www.shodor.org/interactivate/activities/ElapsedTime/

Elapsed Time Worksheets
Generate printable worksheets for elapsed time. You can practice the elapsed time, finding the starting time, or finding the ending time.
http://www.mathnook.com/elapsedtimegen.html

Find the Start Time
Word problems about starting times with multiple-choice answers. Choose "full screen", then "Find the start time". Next, choose option 4 or 5.
http://mathsframe.co.uk/en/resources/resource/119/find_the_start_time

Time for Crime—Elapsed Time Mystery
A single mystery problem which can be solved by thinking of the elapsed time: who is the thief?
http://teacher.scholastic.com/maven/timefor/index.htm

ThatQuiz—Elapsed time
A ten-question quiz on Elapsed Time
http://www.thatquiz.org/tq-g/?-j4-l4-p0

Adding Time Word Problems
Read the time and then answer a word problem involving adding a given time.
http://mathsframe.co.uk/en/resources/resource/118/adding_time_word_problems

CALENDAR

Calendar Clowns
Answer questions about the calendar by clicking on the correct date.
http://mrnussbaum.com/calendarclowns/

Using the Calendar—Questions
Locate information on a calendar, use a calculator to calculate time intervals, and answer questions about next month using this month's calendar.
http://mathsframe.co.uk/en/resources/resource/261

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More on Elapsed Time

Full hours

Sometimes the time that elapses between two different times is so many full hours. You will know that is the case if the two times have <u>the same amount of minutes</u>.

Example 1. From 2:45 to 3:45 the minute hand makes <u>one full circle</u>, starting and ending in the same position (45 minutes). Therefore, from 2:45 to 3:45 is <u>one hour</u>.

Example 2. How much time passes from 7:20 to 10:20?

The minute-amounts are the same (20 minutes), and the hour-amounts differ by 3 hours. This means the minute hand has made 3 full rounds around the clock. So, three hours have passed.

---

1. The minute hand makes full rounds around on the clock. How many whole hours pass?

from	10:30	8:30	1:40	5:45	3:20 AM
to	11:30	12:30	7:40	11:45	12:20 PM
elapsed time					

If two different times have the same hour, you can <u>subtract</u> to find how many minutes pass.

Example 3. How many minutes pass from 11:10 to 11:45?

Since the hours are both 11, just look at the minute-amounts (10 and 45), and subtract them. 45 − 10 = 35. So, 35 minutes pass between those two times.

---

2. How many minutes pass? You can subtract (find the difference).

from	1:25	2:00	3:05	7:30	5:10
to	1:55	2:15	3:25	7:50	5:50
elapsed time	*30 min*				

from	2:00	7:05	8:25	6:40	11:15
to	2:35	7:35	8:50	6:55	11:40
elapsed time					

Use your practice clock if necessary to solve the problems on this page.

3. Solve.

a. It takes Mom 15 minutes to drive to the grocery store.
If she leaves at 3:55, when will she arrive at the store?

b. She leaves the store at 4:40, and this time it takes her 20 minutes to drive home.
What time will she get home?

c. Joshua started math homework at 4:40, and finished it at 5:05.
How much time did he spend doing his math homework?

4. **a.** The bus trip started at 4:10 and ended at 4:30. How many minutes did it take?

b. Music class starts at 10:15 and ends at 10:45. How long is the class?

c. Sergio said, "Oh, I just spent 2 full hours answering emails, and now it's already 11:35!"
At what time did Sergio start answering emails?

5. The clock shows the time now. Write the later times.

TIME NOW:

- 15 min later _____ : _____
- 30 min later _____ : _____
- 2 hours later _____ : _____
- 5 hours later _____ : _____

6. The clock shows the time now. Write the *earlier* times.

TIME NOW:

- 2 hours earlier _____ : _____
- 1 hour earlier _____ : _____
- 40 min earlier _____ : _____
- 25 min earlier _____ : _____

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Chapter 5: Money
Introduction

This chapter of *Math Mammoth Grade 3-A Complete Worktext* teaches counting coins, making change, and solving simple problems about money.

The first lesson, *Using the Half-Dollar*, reviews counting coins, including half-dollars. In the lesson *Dollars*, the student writes dollar amounts using the "$" symbol and the decimal point.

The lesson *Making Change* explains two basic ways of making change: (1) counting up and (2) subtracting (finding the difference). This is all done with mental math. The following lesson, *Mental Math and Money Problems*, also uses mental math, this time in solving simple money problems.

The lesson *Solving Money Problems* introduces the concept of adding and subtracting amounts of money vertically in columns.

You can make free, customizable worksheets for counting common US coins and bills at **https://www.homeschoolmath.net/worksheets/money.php** or by using the worksheet generator that comes with the digital curriculum.

These worksheets are also available for other currencies (Canadian, British, Australian, Euro, South African) — check **https://www.homeschoolmath.net/worksheets**.

The Lessons in Chapter 5

Helpful Resources on the Internet

Use these free online resources to supplement the "bookwork" as you see fit.

Counting Money Activity from Harcourt
Count the coin value, type it into the box, and click 'Check' to verify your answer.
http://www.hbschool.com/activity/counting_money/

Coin Count Game
Drag the coins to the table that equal the target amount, using the correct number of coins.
http://www.mathnook.com/math/coin-count.html

Counting Money Intermediate
Click on the various denominations in the cash drawer so they add up to the correct answer.
http://www.mathnook.com/math/countingmoneyint.html

Coin Combo
Click on the falling coins to match the target amounts.
http://www.tvokids.com/play/tumbletown/coinCombo/coin.swf

Change Maker
Determine how many of each denomination you need to make the exact change. The pictures are
very clear! Playable in US, Canadian, Mexican, UK, or Australian money.
http://www.funbrain.com/cashreg/index.html

Cash Out
Make the correct change by clicking on the bills and coins.
http://www.mrnussbaum.com/cashd.htm

Lunch Lady
The lunch lady must total the purchases of eight students in three minutes, before the next class comes
crashing in. Practice mental additions of money amounts.
http://mrnussbaum.com/lunchlady/

Money Master
Drag the various denominations to the work area to give correct change. Choose "Give change" at the
bottom for 3rd grade work.
https://www.mathsisfun.com/money/money-master.html

Money Game — Problems to Solve
Click on the denominations in the cash register to answer the word problems.
http://www.math-play.com/money-game-3/Money-Game.html

Coins and Medals from U.S. Mint
History and pictures of the circulating coins, commemorative coins, Native American $1 Coin Program,
and the Presidential $1 Coin Program. Learn also how coins are made and take a virtual tour around the
mint.
https://www.usmint.gov/kids/coinsMedals/

Number Bonds To 100 - Drag and Drop
Simple practice where you find two numbers that add up to 100.
https://www.helpingwithmath.com/resources/games/drag_add_to100/AddingToHundred.html

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Dollars

	One dollar. $1 or $1.00	Five dollars. $5 or $5.00.

Write the "$" symbol in front of dollar amounts. Write first the dollars, then a decimal point, and then the cents.	 $1.51	 $5.30

1. How much money? Write the amount.

  a. $_____	 **b.** $_____
  c. $_____	 **d.** $_____
  e. $_____	 **f.** $_____

If you have 100 cents, they make <u>a dollar</u>.

$100¢ = \$1$ $100¢ = \$1$

$100¢ = \$1$
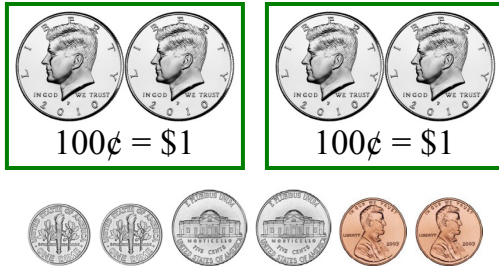
Total $2.32

Total $2.10

2. How much money? Write the amount.

a. $_____

b. $_____

c. $_____

Remember to put 0 into the dollars place if your total cent amount is less than 100.

40 cents = $0.40   82 cents = $0.82   9 cents = $0.09

3. Write as dollar amounts.

a. $_____

b. $_____

c. three nickels
and a dime

$_____

d. eight dimes

$_____

e. seven pennies
and a nickel

$_____

f. three quarters
and two dimes

$_____

4. Write the cent amounts as dollar amounts, and vice versa.

a. 56¢ = $_____	**b.** 6¢ = $_____	**c.** 425¢ = $_____
d. _____¢ = $5.69	**e.** _____¢ = $0.30	**f.** _____¢ = $3.06

5. Mark opened his piggy bank and counted the coins. He had 245 cents.
   He also had $5 in his wallet. How much money does Mark have in total?

6. The picture shows how much money you have. Write how much you will have left if you
   buy the items listed.

If I buy:	I will have left:
a. a puzzle for $5.20	$
b. a book for $7.35	$

If I buy:	I will have left:
c. a book for $4.20 and a magazine for $1.50	$
d. two brushes for $3.35 each	$

If I buy:	I will have left:
e. a pen ($0.60) and an eraser ($0.50)	$
f. three pencils for $0.40 each	$