Math Mammoth Multiplication 1
Contents

Introduction

Math Mammoth Multiplication 1 is a fairly self-explanatory worktext to learn the concept of multiplication and the multiplication tables. It has two parts: The first part concentrates on the concept of multiplication, the order of operations, and word problems. The second part is all about memorizing the times tables. After that, the student can continue on to division.

I have created a systematic approach to memorizing times tables. In this method, one table is studied at a time to mastery. The individual tables are NOT studied in the order of 2, 3, 4, etc. but instead the "easy" tables of 2, 5, 10, and 11 are studied first. The study order also includes studying the table of 4 right after the table of 2, and studying the table of 6 right after the table of 3, because the skip-counting patterns of those tables share some similarities. The lessons emphasize the fact that one multiplication fact is always in two different tables. This way, when the student gets to the hardest tables, the tables of 7, 8, and 12, there are only a few totally new facts to learn.

We always start the study of each table by memorizing the skip-counting pattern 7, 14, 21, 28, etc. first. Then we work on memorizing which fact is associated with which answer. This way your child not only knows what is 8 x 7 but also knows all of it "backwards" - that 56 is in the tables of 8 and 7. That knowledge will be an enormous help later, when the student learns division, factorizing, and finding LCM's or GCF's.

The book also includes a 12x12 grid at the end of almost every lesson in part 2. The boxes for those answers that have not been studied yet are shaded and are not to be filled. Little by little, the shaded areas become fewer and fewer, and the progress is very visible to the student.

I encourage you also to use games for motivation and for practice. I have included a list of online multiplication games for that purpose. Of course, board and card games are perfect as well. However, games are not enough in themselves. The memorization also requires a mental effort from the student: sitting down with the skip-counting list, then with the facts, reading them, and then trying to remember them. The basic age-old technique of covering the list and trying to remember it is still very effective!

I do not want to discount the value of songs or mnemonic devices, but they tend to isolate the facts in the child's mind as separate "odd trivia". This book shows the patterns found in the multiplication tables in order to keep the facts in a structured context, and emphasizes learning the tables "backwards" in order to facilitate learning division.

If the student studies the multiplication tables well at one time, he does not need to come back to them in the fourth, fifth, and sixth grade. One time will be enough, and he can move on to division and other topics.

Part 1: Multiplication Concept

The first lessons introduce the multiplication concept as groups of the same size. *Multiplication on a Number Line* shows how the same-size groups correspond to repeated "jumps" or "skipping" on a number line. In this lesson, the child should connect skip-counting with multiplication.

Then the lesson *Multiplication as an Array* shows another model for multiplication: objects arranged in

rows and columns. In this lesson the rows are thought of as groups - and so it follows that the same model of multiplication as the idea of having many of the same-size groups. The whole lesson is still presented with pictures.

Order of Operations 1 teaches that multiplication is to be done before addition or subtraction, and addition and subtraction are done from left to right.

Understanding Word Problems 1 shows how word problems including multiplication have the idea of "each", "every one", or "all": each thing is doing or having the same number of something. If the problems are difficult, the student can draw a picture to help, such as drawing flowers in pots, pizza slices, etc.

Understanding Word Problems, part 2 has more challenging problems. Often the word problems in school books are far too easy, and that causes students to just take the numbers that appear in the problem, apply the operation the lesson is about, and get by without really understanding. If it is too difficult, skip it for now and come back to it later - for example after some times tables practice. However, before you give up, first try to help your student by drawing a picture for each problem.

Multiplication in Two Ways concentrates on the fact that it does not matter in which order the factors are. Objects presented in an array show this fact nicely when you either consider the rows as groups, or the columns as a group. Jumping on the number line is studied also.

Multiplying By Zero is illustrated with both the model of several groups of zero size (and zero groups of some size) and with the model of making several zero jumps on a number line (and making zero or no jumps).

Part 2: Memorizing Multiplication Tables

Effective Oral Drilling is meant for the teacher. It is a guide to how to do drilling practice.
Table of 2 - 11 new facts to learn.
Table of 4 - 10 new facts. These are doubles of those in the table of two.
Table of 10 - 9 easy facts.
Table of 5 - 8 new facts.
More Practice and Review is a break from memorizing new tables.
Table of 3 - 7 new facts.
Table of 6 - 6 new facts. These are doubles of those in the table of 3.
Table of 11 - 5 new facts, four of them are easy.
Table of 9 - 4 new facts.
Table of 7 - 3 new facts.
Table of 8 - 2 new facts.
Table of 12 - 1 new fact.

I wish you success with math teaching!

Maria Miller, the author

Helpful Resources on the Internet

Use these free online resources to supplement the "bookwork" as you see fit.
You can access an up-to-date online version of this list at
www.mathmammoth.com/weblinks/multiplication_1.htm

Structured Drill for Multiplication Tables - Video
This is my video that explains the main points of the structured drill I advocate for multiplication tables.
http://www.youtube.com/watch?v=sZlBtMPrMyk

Math Dice Game for Addition and Multiplication
Instructions for three simple games with dice; one to learn the multiplication concept, 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

Explore the Multiplication Table
This applet visualizes multiplication as a rectangle.
http://www.mathcats.com/explore/multiplicationtable.html

Multiplication Number Lines
First choose a tile from the 10x10 grid to pose a problem, then you will see it illustrated on a number line.
http://www.ictgames.com/multinumberlines.html

Multiplication Memory Game
Click on corresponding pairs (problem-answer).
http://www.dositey.com/2008/muldiv/memorymult.htm or
http://www.dositey.com/2008/muldiv/memorymult34.htm

Multiplication Mystery
Drag the answer tiles to the right places in the grid as they are given, and a picture is revealed
http://www.harcourtschool.com/activity/mult/mult.html

Multiplication.com Interactive Games
A bunch of online games just for the times tables.
http://www.multiplication.com/interactive_games.htm

Multiplication Grid
Drag the scrambled answer tiles into the right places in the grid as fast as you can!
http://www.mathcats.com/microworlds/multiplication_grid.html

Raging Rectangles and Multiple Madness (PDF)
Two fun printable board games for multiplication; Raging Rectangles is on page 2 and Multiple Madness is on page 6 of the download.
http://mathlearnnc.sharpschool.com/UserFiles/Servers/Server_4507209/File/Instructional%20Resources/G3WW21-24.pdf

The Times Tables at Resourceroom.net
Fill in the multiplication chart - partially or the whole thing - or take quizzes, and get graded.
http://www.resourceroom.net/Math/1timestables.asp

Math Trainer - Multiplication
Multiplication table training online that responds to your answers and will train your weaknesses.
http://www.mathsisfun.com/games/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

Multiplication Table Challenge
100 questions, timed.
http://www.programmingart.com/free/games/multiply/

Mr. Taylor's Multiplication Facts Drill
Simple practice (click on the right answer) for the easy ones, the hard ones, the monsters, or them all.
http://www.geocities.com/multiplicationfacts

Quiz Hub - Multiplication game
Click on corresponding pairs (problem-answer).
http://quizhub.com/quiz/f-multiplication.cfm

Times tables from BBC Skillswise
Has printable fact sheets, online quizzes, two grid games, and five printable worksheets.
http://www.bbc.co.uk/skillswise/numbers/wholenumbers/multiplication/timestables/index.shtml

Product Game
A fun, interactive two-player game that exercises your skill with factors and multiples.
http://illuminations.nctm.org/ActivityDetail.aspx?ID=29

Two Minute Warning
Solve as many problems as you can in two minutes.
http://www.primarygames.com/flashcards/multiplication/start.htm

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