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# Introduction

*Math Mammoth Add & Subtract 4* covers the following addition and subtraction related topics in the fourth grade level:

- mental addition and subtraction strategies;
- adding and subtracting in columns;
- some numerical patterns;
- bar models in problem solving;
- order of operations;
- line graphs and bar graphs;
- rounding and estimating;
- money problems and discounts.

At first, we review the “technical aspects” of adding and subtracting: mental math techniques and adding and subtracting in columns. We also study some patterns. The lesson on Pascal's triangle is intended to be fun and fascinating—after all, Pascal's triangle is full of patterns!

In the next lesson, we study the connection between addition and subtraction and bar models. Bar models help students write addition and subtraction sentences with unknowns, and solve them. This is teaching the students *algebraic thinking*: how to write and solve simple equations.

The lesson on the order of operations contains some review, but we also study connecting the topic with real-life situations (such as shopping). Here, the student writes the mathematical expression (number sentence) for word problems, which again, practices algebraic thinking.

Going towards applications of math, the book then contains straightforward lessons on bar graphs, line graphs, rounding, estimating, and money problems.

*I wish you success in your math teaching!*  
*Maria Miller, the author*

## Helpful Resources on the Internet

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

### Calculator Chaos

Most of the keys have fallen off the calculator but you have to make certain numbers using the keys that are left.

[http://www.mathplayground.com/calculator\\_chaos.html](http://www.mathplayground.com/calculator_chaos.html)

### ArithmeTiles

Use the four operations and numbers on neighboring tiles to make target numbers.

<http://www.primarygames.com/math/arithmetiles/index.htm>

### Choose Math Operation

Choose the mathematical operation(s) so that the number sentence is true. Practice the role of zero and one in basic operations or operations with negative numbers. Helps develop number sense and logical thinking.

<http://www.homeschoolmath.net/operation-game.php>

### MathCar Racing

Keep ahead of the computer car by thinking logically, and practice any of the four operations at the same time.

<http://www.funbrain.com/osa/index.html>

### Fill and Pour

Fill and pour liquid with two containers until you get the target amount. A logical thinking puzzle.

[http://nlvm.usu.edu/en/nav/frames\\_asid\\_273\\_g\\_2\\_t\\_4.html](http://nlvm.usu.edu/en/nav/frames_asid_273_g_2_t_4.html)

### Division and Order of Operations and Division and Addition - Order of Operations

Two mystery picture games.

<http://www.dositey.com/2008/math/m/mystery2MD.htm> and

<http://www.dositey.com/2008/math/m/mystery2AD.htm>

### Order of Operations Quiz

A 10-question online quiz that includes two different operations and possibly parentheses in each question. You can also modify the quiz parameters yourself.

<http://www.thatquiz.org/tq-1/?-j8f-la>

### The Order of Operations Millionaire

Answer multiple-choice questions that have to do with the order of operations, and win a million. Can be played alone or in two teams.

<http://www.math-play.com/Order-of-Operations-Millionaire/order-of-operations-millionaire.html>

### Exploring Order of Operations (Object Interactive)

The program shows an expression, and you click on the correct operation (either +, —, ×, ÷ or exponent) to be done first. The program then solves that operation, and you click on the *next* operation to be performed, etc., until it is solved. Lastly the resource includes a game where you click on the falling blocks in the order that order of operations would dictate.

[http://www.learnalberta.ca/content/mejhm/html/object\\_interactives/order\\_of\\_operations/use\\_it.htm](http://www.learnalberta.ca/content/mejhm/html/object_interactives/order_of_operations/use_it.htm)

### **Order of Operations Practice**

A simple online quiz of 10 questions. Uses parentheses and the four operations.

<http://www.onlinemathlearning.com/order-of-operations-practice.html>

### **Quick Calculate**

Practice your arithmetic of all four operations plus the order of operations.

<http://themathtgames.com/arithmetic-games/addition-subtraction-multiplication-division/quick-calculate-game.php>

### **Estimate Addition Quiz**

Scroll down the page to find this quiz plus some others. Fast loading.

[http://www.quiz-tree.com/Math\\_Practice\\_main.html](http://www.quiz-tree.com/Math_Practice_main.html)

### **Shop 'Til You Drop**

Get as many items as you can and be left with the least amount of change, and practice your addition skills. The prices are in English pounds and pennies.

<http://www.channel4.com/learning/microsites/P/puzzlemaths/shop.shtml>

### **Change Maker**

Determine how many of each denomination you need to make the exact change. Good and clear pictures! Playable in US, Canadian, Mexican, UK, or Australian money.

<http://www.funbrain.com/cashreg/index.html>

### **Cash Out**

Give correct change by clicking on the bills and coins.

<http://www.mrnussbaum.com/cashd.htm>

### **Piggy Bank**

When coins fall from the top of the screen, choose those that add up to the given amount, and the piggy bank fills.

<http://fen.com/studentactivities/Piggybank/piggybank.html>

### **Bar Chart Virtual Manipulative**

Build your bar chart online using this interactive tool.

[http://nlvm.usu.edu/en/nav/frames\\_asid\\_190\\_g\\_1\\_t\\_1.html?from=category\\_g\\_1\\_t\\_1.html](http://nlvm.usu.edu/en/nav/frames_asid_190_g_1_t_1.html?from=category_g_1_t_1.html)

### **An Interactive Bar Grapher**

Graph data sets in bar graphs. The color, thickness and scale of the graph are adjustable. You can put in your own data, or you can use or alter pre-made data sets.

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=63>

### **Create a Graph**

A neat online tool for creating a graph from your own data.

<http://nces.ed.gov/nceskids/createagraph/>

### **Math Mahjong**

A Mahjong game where you need to match tiles with the same value. It uses all four operations and has three levels.

[http://www.sheppardsoftware.com/mathgames/mixed\\_mahjong/mahjongMath\\_Level\\_1.html](http://www.sheppardsoftware.com/mathgames/mixed_mahjong/mahjongMath_Level_1.html)

### **Pop the Balloons**

Pop the balloons in the order of their value. You need to use all four operations.

<http://www.sheppardsoftware.com/mathgames/numberballoons/BalloonPopMixed.htm>

### **Free worksheets for order of operations**

Generate printable & 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](http://www.homeschoolmath.net/worksheets/order_of_operations.php)

### **My Dear Aunt Sally**

A fun game you can play online for free, or purchase as an app. Choose whole numbers, integers, fractions, decimals, or rational numbers, and then which of the five operations to use. In the game, you need to place the given numbers into two expressions so that the operations make the two expressions have the same value.

<http://www.mydearauntsally.com>