
Math Mammoth Fractions 1

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Introduction

Math Mammoth Fractions 1 is the first book of two that cover all aspects of fraction arithmetic. This book at hand covers the concepts of fraction and mixed numbers, equivalent fractions, adding and subtracting like and unlike fractions, adding and subtracting mixed numbers, and comparing fractions. The book *Fractions 2* covers simplifying fractions and multiplication and division of fractions.

Studying fractions involves lots of rules, and many students learn them only mechanically, not really understanding the underlying concepts and principles. Then they end up making lots of mistakes because they confuse the different rules and either apply the wrong one or apply the right rule but don't remember it quite right. All this can make students even fear fraction math.

To avoid that, this book uses the visual model of a pie divided into slices all the way through the book. It is a very natural model, because it uses a circle that can be divided into any number of circle sectors (slices). When students work with this model from lesson to lesson, they will eventually be able to “see” these pies in their mind. This, in turn, gives them the ability to do many of the easier fraction calculations mentally. It also enables students to really UNDERSTAND these concepts, and not just learn mechanical rules.

You are welcome to use manipulatives alongside the book; however the visual pie model is probably sufficient for most students in 5th grade level. I have also included (in the appendix) printable cutouts for fractions from halves to twelfths. You can use them to make your own fraction manipulatives.

To make the manipulatives sturdier, glue the printed pages on cardboard, and cut the parts only after gluing. The whole circle is there to illustrate “one whole” - needed when studying mixed numbers. You will probably need to print at least two copies of each cutout page. You can use the white cutout fractions if you need to save on ink and let children color them. Just use consistent colors so that thirds are always the same color, fourths are the same color, etc.

In the first lesson, **Understanding Fractions**, the student learns to draw pie models of certain common fractions. This skill is needed later on in various exercises through the book.

The lesson **Mixed Numbers** teaches the concept with pictures. The child also writes mixed numbers as fractions.

The next lessons, titled **Part of a Whole Group 1, 2, and 3** have to do with finding a part of a certain number of objects, and of course has lots of practical applications. It ties the concept of a fraction with division of whole numbers.

Next we study adding and subtracting like fractions, which is an easy topic. Next is lesson reviews mixed numbers and further practices changing mixed numbers to fractions and vice versa. Next we add and subtract mixed numbers with like fractional parts.

Then, it is time to study equivalent fractions, as a prerequisite for adding unlike fractions. Equivalent fractions are presented as parts that have been split further. The rule is to multiply both the numerator and the denominator by the same number, but try to emphasize the terminology of “splitting the existing parts into so-and-so many pieces” or something similar. That should help students to understand the concept instead of memorizing a mechanical rule.

Add Unlike Fractions 1 is an introductory lesson in the sense that the student is not yet introduced to the rule for finding the common denominator. In this lesson, the common denominator is either given, or the student figures it out using pictures.

Add Unlike Fractions 2 emphasizes the idea that we need to find a common denominator, and then convert the fractions to like fractions before adding. Many textbooks introduce here the concept of Least Common Denominator, LCD, which is the best common denominator to use since it is the smallest. That concept tends to be only memorized and poorly understood, so the lesson here does not overtly emphasize that one always needs to find the LCD. Your student will encounter the concept of LCD again in 6th and 7th grade.

Finally we also add and subtract mixed numbers with unlike fractional parts, and add & subtract several unlike fractions.

The last new concept in this book is that of comparing fractions. Once the student has mastered converting two fractions to equivalent, like fractions, this should be fairly easy.

Answers are in the end of the book.

*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.
You can access an up-to-date online version of this list at
www.mathmammoth.com/weblinks/fractions_1.htm*

Fractions and Mixed Numbers

Clara Fraction's Ice Cream Shop

A game in which you convert improper fractions to mixed numbers and scoop the right amount of ice cream flavors on the cone.

www.mrnussbaum.com/icecream/index.html

Equivalent Fractions

Equivalent Fractions video

A video by the author that ties in with the equivalent fraction lessons in this book.

<http://www.youtube.com/watch?v=NF57T60CSPs>

Equivalent Fractions from National Library of Virtual Manipulatives (NLVM)

See the equivalency of two fractions as the applet divides the whole into more pieces.

http://nlvm.usu.edu/en/nav/frames_asid_105_g_2_t_1.html

Equivalent Fractions

Draw two other, equivalent fractions to the given fraction. Choose either square or circle for the shape.

<http://illuminations.nctm.org/ActivityDetail.aspx?ID=80>

Fraction Frenzy

Click on pairs of equivalent fractions, as fast as you can. See how many levels you can get!

www.learningplanet.com/sam/ff/index.asp

Fresh Baked Fractions

Practice equivalent fractions by clicking on a fraction that is not equal to others.

www.funbrain.com/fract/index.html