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# Math Mammoth Decimals 1

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# Introduction

*Math Mammoth Decimals 1* is an introduction to decimal numbers, and suits best 4th and 5th grade in normal teaching.

The book deals with decimal numbers that have tenths and hundredths - numbers with maximum of *two decimal digits*. The idea here is to lay a strong conceptual foundation in students' minds so that they can do the basic operations with these decimals mentally.

Of the operations, the book deals with addition, subtraction, and multiplying by a whole number, with strong emphasis on mental calculations. Multiplying a decimal by a decimal is not presented in this book, and division is not dealt with at all.

Why is that? The idea is to lay such a *solid foundation* that the student grasps the *concepts* and does not succumb to rote memorization of calculation rules without understanding.

The two operations not dealt with in the book are multiplying a decimal by a decimal, and decimal division. These two operations are the ones that students often only memorize how to do them - and sadly also often forget a few years afterwards.

*Decimals 1* book uses number lines, fraction models, and place value charts - and makes the student draw them too - to teach the concepts of *tenths* and *hundredths*. Other topics covered are comparing decimals, adding and subtracting decimals both mentally and in columns, multiplying a decimal by a whole number both mentally and in columns, rounding, estimating, and money problems.

If children cannot add decimals mentally, they may rely too much on adding in columns or on the calculator, without really understanding decimals. That is why in my book the student is often made to compare decimal operations with corresponding fraction operations.

A common error is to add  $0.4 + 0.8 = 0.12$  etc.: children consider the decimal part of a number as a 'separate whole number' and try to apply whole number arithmetic within the decimal part. Emphasizing the equivalency to fractions and how fractions are added should help.

The student should think of 0.4 as “four tenths” and 0.8 as “eight tenths”, and then realize how twelve tenths is more than one, hence  $0.4 + 0.8 = 1.2$ .

The book also emphasizes how to add decimals of different “length”. When adding one number with one decimal digit and another with two, for example  $0.4 + 0.08$ , you will 'tag' a zero to the end of 0.4 so both addends will have same amount of decimal digits. This is the exact same thing as making the corresponding fractions to have the same denominator (denominators 10 and 100 are made to be 100 and 100).

*I wish you success in your math teaching!*

*Maria Miller, the author*