

**THE NEW NORMAL PRIMARY
ARITHMETIC: DESIGNED AS AN
INTRODUCTION TO A THOROUGH
AND COMPLETE COURSE IN
MENTAL AND WRITTEN ARITHMETIC**

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The New Normal Primary Arithmetic: Designed as an Introduction to a Thorough and Complete Course in Mental and Written Arithmetic by Edward Brooks

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EDWARD BROOKS

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PRIMARY ARITHMETIC,

DESIGNED AS AN
INTRODUCTION

TO A
THOROUGH AND COMPLETE COURSE
IN

MENTAL AND WRITTEN ARITHMETIC.

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ALGEBRA," "NORMAL GEOMETRY AND TRIGONOM-
ETRY," "PHILOSOPHY OF ARITHMETIC," ETC.

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PREFACE.

THIS little work, as its title indicates, is designed to precede, and prepare the student for a thorough course in Mental and Written Arithmetic. Its peculiarities, although such as can be better appreciated by an examination of the book itself, will be briefly specified.

1. *Oral exercises* have been made a prominent feature of the plan, and many suggestions are presented indicating the manner in which such exercises should be conducted.

2. Addition and Subtraction are so arranged that they must be taught simultaneously—the process of Subtraction thus being derived as a result of Addition. This is the method adopted by some of our best educators, and is based upon sound philosophy. Multiplication and Division are treated in the same manner—Division being presented as an inverse process, and hence a result, of Multiplication.

In Multiplication, instead of requiring the pupil to commit to memory a multiplication table, without his having an idea of the origin or use of it, he is led to derive it for himself, and then learn it for the purpose of avoiding the labor of obtaining a product each time he wishes to use it. The child is taught to derive his own division table from the table of products.

3. The fact that mental and written exercises should be combined in the child's first book being so evident, the author has given a large collection of problems for slate or blackboard exercises, to be used in connection with the exercises in mental arithmetic.

4. The author has omitted all representations of objects by means of *pictures*. Many reasons might be offered for this, among the most prominent of which is the fact that they are not needed, since the objects themselves are preferable to mere pictures of objects. The pupil should be so thoroughly drilled with Oral Exercises that by the time he can read a book on Arithmetic he may be able to compute without the assistance either of objects or their pictures.

5. Much care has been exercised throughout the entire work that the arrangement should be systematic, the lessons carefully graded, and the whole be in accordance with the principles of Analysis and Induction.

The entire work is the result of much thought and observation in primary instruction, and is presented to a discriminating public, with the earnest desire that it may do much for the education of the youth of our country.

EDWARD BROOKS.

State Normal School, June 16, 1878.

SUGGESTIONS TO TEACHERS.

THE following suggestions are made for the younger and less experienced teachers who may use this work:

1. It is respectfully suggested that the Oral Exercises receive that attention which their great importance demands. The pupils should be constantly drilled on exercises besides those found in the book. With young pupils, all numerical ideas should be developed with objects; lessons with the numeral frame will also be found of great value.

2. The problems in Mental Arithmetic should be assigned promiscuously, pupils not being allowed to use the book during recitation. The pupil selected should arise, repeat the problem, and then give the solution; at the close of which those who have observed mistakes may indicate it by raising the hand, and then some one indicated by the teacher may give the criticism. Sometimes the entire class may be required to merely write the result on paper or the slate.

3. The exercises in Written Arithmetic should be solved upon paper or the slate as a preparation for the recitation, and upon the blackboard, slate, or paper during the recitation. The same problem may be given to the whole class, or each member may receive a different problem, as the teacher prefers; with beginners the first method is thought to be preferable. At first perhaps it is better to teach them the mechanical operations, showing them the reasons for these operations, but not requiring them to state these reasons in recitation until they have acquired considerable readiness in the different processes. This last suggestion is founded upon the natural order of the unfolding of the young mind, and also upon the experience of some of the most successful teachers of youth.

4. The elementary *sums* and *products* should at first be derived with objects; and after pupils understand them and know how to derive them, special pains should be taken to have them committed to memory. The elementary differences are to be derived from the elementary sums and the elementary quotients from the elementary products.

5. Teachers who desire to do so can combine corresponding lessons in addition and subtraction, as adding and subtracting by 2s, adding and subtracting by 3s, etc. Similar combinations may also be made in multiplication and division; and the products and quotients with the smaller numbers may be learned before all the elementary sums and differences are completed.

6. Care should be taken that the pupils' language be free from all those awkward expressions so common to learners; each sound should be enunciated distinctly, each word correctly pronounced, and the habit of ready and accurate thought be developed—thus securing that combination so admirable in scholarship,—promptness, accuracy, and elegance.

NEW PRIMARY ARITHMETIC.

SECTION I.

NUMERATION AND NOTATION.

INTRODUCTION.

Suggestions to the Teacher.

OUR first ideas of numbers are derived from visible objects, hence the child's first lessons in numbers should be given with such objects. These objects may be books, pencils, grains of corn, beans, etc. Dr. HILL suggests that arithmetic may be taught with a pint of beans. The *arithmetical frame* is the most convenient for general use.

NAMING NUMBERS.—The names of numbers are usually acquired with the ideas of numbers; and both are given by a process called *counting*. Children should therefore be taught *to count*. Be careful that they do not use the names as mere words; see that they know what the words mean. Children can often count as far as a hundred, and yet are unable to select twelve objects from a collection. Have the pupils count with the *numeral frame* and with other objects.

Beside the common method of counting, I would teach pupils to count, using the expressions *one and ten, two and ten, three and ten, etc., two tens and one, two tens and two, etc.* It will teach them the principle of naming numbers, and prepare them to understand the method of writing numbers.

A counting exercise may be made lively by increasing or diminishing the number by several at the same time. Little *counting games*, with beans or grains of corn, will also be found interesting to children. Have children count *backward* as well as *forward*.

WRITING NUMBERS.—As soon as a child can name numbers, it should be taught to write them. It might be well at first to write the words *one, two, etc.*, and then introduce the figures, that pupils may see their advantage in brevity.