

**A PRIMARY
ARITHMETIC:
PART I AND PART II**

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A Primary Arithmetic: Part I and Part II by Edward Olney

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EDWARD OLNEY

**A PRIMARY
ARITHMETIC:
PART I AND PART II**

A
PRIMARY
ARITHMETIC.

PART I.

THE FUNDAMENTAL COMBINATIONS OF THE DIGITS, AND A PRIMARY
COURSE IN COMMON FRACTIONS AND DENOMINATE NUMBERS.

FOR FIRST AND SECOND GRADES (YEARS).

PART II.

A CONDENSED COURSE FOR PRACTICAL LIFE, INCLUDING BARTER,
AND "CASTING INTEREST."

FOR THIRD AND FOURTH GRADES.

By EDWARD OLNEY,

PROFESSOR OF MATHEMATICS IN THE UNIVERSITY OF MICHIGAN, AND AUTHOR
OF A SERIES OF MATHEMATICAL TEXT-BOOKS.

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OLNEY'S PRIMARY ARITHMETIC.

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OLNEY'S PRACTICAL ARITHMETIC.

OLNEY'S SCIENCE OF ARITHMETIC.

TEACHER'S HAND-BOOK OF ADDITIONAL EXAMPLES AND EXERCISES.

INTRODUCTION TO ALGEBRA

COMPLETE ALGEBRA

TEST EXAMPLES IN ALGEBRA

OLNEY'S HIGHER MATHEMATICS.

UNIVERSITY ALGEBRA

ELEMENTS OF GEOMETRY

ELEMENTS OF TRIGONOMETRY

GEOMETRY AND TRIGONOMETRY, UNIVERSITY EDITION.

GENERAL GEOMETRY AND CALCULUS

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PREFACE.

IT is thought that the spirit of this book, and the manner of using it, will be so evident, as the teacher reads it over, that few prefatory words are needed. The following are some of the leading principles by which the author has been guided. How they have been wrought out can be seen only by examining the book itself.

1. A text-book for schools should be arranged with reference to sound principles of teaching, and to convenience of use in the school-room, quite as much as to the principles of the science which it develops.

2. *One thing at a time* is the fundamental maxim of primary teaching. Each exercise must have a single, clearly defined purpose.

3. *Unity of purpose* and almost infinite *diversity of means* characterize the most successful teaching of the young.

4. The young child must be furnished something to *do*. His hands, his eyes, and, as much as may be, his tongue and his whole body, must be busied with the work in hand.

5. In a well-conducted primary school, as careful attention will be given to secure profitable employment for the pupils in the seats, as to the conduct of the class exercises.

6. The cases are exceptional, and very rare, in which much labor or time need be bestowed in order to awaken in the mind of the child the conception of number. The recognition of number is one of the most simple, earliest developed—in fact,

most nearly innate—of all our mental acts. The child who has learned to count 10 by means of objects, has as well-defined, practical notions of number, as he needs, and as he advances with the simple processes of combination, his conceptions will enlarge as occasion requires.

7. There are two distinct mental processes required in obtaining a mastery of the elementary combinations of numbers:

1. *The method by which we determine what the result of the combination is, and*

2. *The fixing of that result in the memory.*

Thus, it is one thing for the pupil to learn how he may find out how many 6 times 7 makes, and quite another thing to fix this product in his mind. The former is a *process*, which the child who can count will readily learn, and which he will always apply with pleasure. The latter is a pure act of memory, and the pupil needs all the help an ingenious teacher can devise, to save it from becoming intolerable drudgery. In a single lesson, the child who can count one hundred, will learn to make the Multiplication Table as far as 10 times 10. But to remember these 100 products, so that they can be instantly named, is no less a task than to memorize the answers to any other 100 problems. The same may be said of the Addition, Subtraction, and Division Tables; for they are none of them well learned until the results can be recalled without any mental process except the instantaneous act of the memory.

8. *To perceive and to remember* are the chief mental exercises of the grade of pupils for which this book is prepared. Such pupils cannot be expected to give formal statements either of definitions, processes, or reasons; and much less can they obtain conceptions and learn processes from abstract statements. Hence, formal definitions, rules, and processes of reasoning are out of place in such a book.

9. Usually the child who cannot count cannot read; and the processes of learning to read and learning the elementary com-

binations of numbers are going on at the same time. Accordingly, in this book the first 27 pages are addressed to the Teacher; the next 90 are addressed to "pupils reading simple words;" and the remainder of the book assumes that the pupil has learned to read tolerably well.

10. According to the decimal notation, the fundamental combinations embrace only numbers below and including 10. To such combinations this book is, therefore, confined.

11. One is more interested in what he has made himself, than in that which is furnished by another. Hence the pupil is taught *how to make* the Addition, Subtraction, Multiplication, and Division Tables for himself, and, having made them, *to study his own work*. None of these tables are given, except in form, in this book.

12. From objects in sight and in hand to objects out of sight—from the concrete to the abstract, from the known to the unknown, by short and easy steps—an arrangement which will make each advance include a practical review, etc., are principles so well established that no intelligent teacher will countenance the violation of them.

The teacher who is familiar with the methods of the Kindergarten will recognize the spirit of those methods on every page of this book. Indeed, it has been a leading purpose to embody this spirit in forms which are practicable for use in our ordinary Primary Schools.

The special purpose of each part is exhibited in the title-page and in a prefatory note.

EDWARD OLNEY,

UNIVERSITY OF MICHIGAN, December, 1874.

NOTE.—Since the plates of this book were first cast, the whole book, in complete form, has been thoroughly examined by a number of practical teachers in different parts of the country, and carefully revised. The exceedingly liberal spirit of the publishers has allowed the author to make such revision to any extent he desired. To Prof. N. A. CALKINS, of the New York City Normal School, the author is very greatly indebted for valuable suggestions in connection with this work of revision.

E. O.

PROGRAMME FOR A DAY IN A PRIMARY SCHOOL

FORENOON.

TIME.	"A" CLASS.	"B" CLASS.	"C" CLASS.
9 to 9:15	Opening Exercises.		
9:15 to 9:25	Writing, st.	Reading, st.	Reading, cl.
9:25 to 9:35	Reading, st.	Reading, cl.	Arithmetic, st.
9:35 to 9:45	Reading, cl.	Drawing, st.	Printing, B-B.
9:45 to 9:50	Gymnastics, and Oral Concert Exercises.		
9:50 to 10	Drawing, B-B.	Arithmetic, st.	Arithmetic, cl.
10 to 10:10	Arithmetic, st.	Arithmetic, cl.	Drawing, st.
10:10 to 10:20	Arithmetic, st.	Writing, st.	Oral Teaching.
10:20 to 10:40	Recess.		
10:40 to 10:50	Arithmetic, cl.	Drawing, B-B.	Writing, st.
10:50 to 11	Geography, st.	Reading, st.	Reading, cl.
11 to 11:10	Geography, st.	Reading, cl.	Drawing, st.
11:10 to 11:20	Geography, cl.	Drawing, st.	Arithmetic, st.
11:20 to 11:30	Gymnastics, and Oral Concert Exercises.		
11:30 to 11:40	Writing, st.	Arithmetic, st.	Oral Teaching.
11:40 to 11:50	Arithmetic, st.	Arithmetic, cl.	Printing, st.
11:50 to 12	Arithmetic, cl.	Printing, st.	Drawing, B-B.

AFTERNOON.

9 to 9:10	Writing, st.	Reading, st.	Reading, cl.
9:10 to 9:20	Nt. History, st.	Reading, cl.	Arithmetic, st.
9:20 to 9:30	Nt. History, cl.	Writing, st.	Printing, B-B.
9:30 to 9:45	Gymnastics, Stories, and Moral Lessons.		
9:45 to 9:55	Arithmetic, st.	Arithmetic, st.	Arithmetic, cl.
9:55 to 3:05	Arithmetic, st.	Arithmetic, cl.	Writing, st.
3:05 to 3:20	Recess.		
3:20 to 3:30	Arithmetic, cl.	Drawing, st.	Drawing, st.
3:30 to 3:40	Drawing, st.	Spelling, st.	Oral Teaching.
3:40 to 3:50	Spelling, st.	Spelling, cl.	Printing, st.
3:50 to 4	Spelling, cl.	Writing, st.	Drawing, st.