

**STANDARD EDUCATIONAL  
SERIES. STANDARD ELEMENTARY  
ARITHMETIC: COMBINING  
ORAL AND WRITTEN EXERCISES**

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**EDWARD SYLVESTER ELLIS**

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*STANDARD EDUCATIONAL SERIES.*

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STANDARD  
ELEMENTARY  
ARITHMETIC

COMBINING

ORAL AND WRITTEN EXERCISES.



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## INTRODUCTION.

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It is believed that there is a unity of plan and execution in the *Elementary* and the *Complete Arithmetic* of this course which is found in no other arithmetical series.

As the processes of oral and written arithmetic are precisely the same, the so-called *Mental Arithmetic* should not be made a distinct study. In fact, without ignoring other indispensable studies, there is no time for two daily lessons in arithmetic. The *Progressive Oral and Written Drills*, and the *Inductive and Oral Exercises*, provide so abundantly for developing and fixing all the introductory and fundamental facts, that a separate book would be superfluous.

In the *Progressive Oral and Written Drills*, advancement is made from the simpler to the more difficult combinations. The pupil almost unconsciously learns and retains the various facts or combinations, and recalls them without apparent thought. Such facility as this in addition, subtraction, multiplication and division, can be acquired only by the graded work of advancing from one digit to another.

The definitions, rules, analyses and manner of treatment, are the same in both books. The fundamental rules are developed separately and are afterward combined. It is believed that by treating them conjointly at the start, the child is brought too abruptly to the consideration of a union of principles, which, for the sake of simplicity and directness, should be treated apart. Mental growth and strength depend upon clear conceptions, and rest upon the fundamental principle, "Do one thing at a time and do it well." Hence, after treating addition and subtraction separately, they are combined, the same course being followed with multiplication and division; also with fractions.

In the *Standard Arithmetics*, the work which is partly oral and partly written, has been prepared with great care, and will be found fresh, vigorous, and practical. The aim constantly has been to make the examples interesting problems of fact, and to give directness, simplicity, and clearness to every statement, so as to remove all needless difficulty from the task of the young student of numbers. Progress comes more from properly graded new matter than from wearisome repetition. Growth is the result not of repetitions but of additions: hence, space and time are not devoted to such repetitions. Pictures are discarded, because they divert attention and afford little aid in grasping arithmetical ideas.

No answers are given to the oral exercises, which are so constructed that the child can scarcely go astray in their solution. Should he do so, other pupils will be sure to detect the error. The answers to the written problems (except in a few instances) will be found at the end of the book.

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## HOW TO USE THIS BOOK.

### I. MAKING NUMBERS.

AFTER counting with and without objects up to 10, show pupils how numbers are made, using the numeral frame or objects. Thus: 4 consists of four 1's; two 2's; a 3 and a 1; or one 4.

ILLUSTRATION:  $||||$ ;  $|| ||$ ;  $||| |$ ;  $||||$ .

*Remark.*—Require pupils to show and tell how 5, 6, 7, 8, and 9 are made.

### II. PROGRESSIVE DRILLS.

Take three combinations as suggested and drill upon them until the pupils know them thoroughly. Then take three

ILLUSTRATION:  $|| ||$      $2 + 2$   
 $|||| ||$      $5 + 2$   
 $|||||| ||$      $8 + 2$

more facts and drill upon them in the same manner, keeping up a continual review of the facts already learned. Since adding numbers is thinking them together, the pupil must be led to realize each combination so as to make it entirely his own.

### III. INDUCTIVE EXERCISES.

Facility in naming results of numbers applied to objects, is of prime importance. Such exercises conduce to correct and rapid thinking in arithmetic.

### IV. ORAL EXERCISES.

Too great weight cannot be attached to the oral exercises. In every instance the problem should be stated clearly and but once. Then designate the boy or girl who is to solve it. The pupil should immediately repeat the example, and reason it out to a correct result. If he is unable to state it correctly, he should be charged with a failure. Attention will thus be fostered, memory strengthened, a rigidly logical method of solution acquired, and pupils will soon do creditable and even brilliant work.

### V. WRITTEN EXERCISES.

In solving problems on the blackboard, the oral method should be insisted upon, until the analysis is thoroughly understood. He who formulated the first rule for the addition of numbers, must have done so from investigation, and such should be the course of every student of arithmetic.

# ELEMENTARY ARITHMETIC.

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## PART I.

### First Lessons in Numbers.

**SUGGESTIONS.**—First Lessons in numbers involve (1) counting, (2) making numbers, and (3) expressing numbers and indicating operations. A numeral frame and collections of objects such as pencils, marbles, tooth-picks, etc., are needed for illustration. Counting is telling objects one by one in order to find out how many there are. Let children be employed in counting objects. Adding is joining things or numbers together so as to form a whole. Making numbers is putting smaller numbers together to form larger ones. Expressing numbers is using figures to represent the numbers and signs to show what is to be done with them.

#### I. Counting.

Give each child in the class a number of objects and ask him to hold up one of them. How many have you? *One*. Hold up another. Put them together. How many have you now? *Two*. Hold up two other objects. Hold them in your left hand and pick up another. How many have you in your left hand? *Two*. How many in your right hand? *One*. Put them together. How many have you now? *Three*. Pick up three other objects. Hold them in your left hand and pick up another. How many have you in your left hand? *Three*. How many in your right hand? *One*. Put them together. How many have you now? *Four*. What number is one less than three?—one more than three? Hold four objects in your left hand and pick up another. How many have you in your left hand? *Four*. How many in your