

**HARVEY'S ESSENTIALS OF  
ARITHMETIC, WITH EVERYDAY  
PROBLEMS RELATING TO  
AGRICULTURE, COMMERCE AND  
OTHER VOCATIONS; FIRST BOOK**

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Harvey's Essentials of Arithmetic, with Everyday Problems Relating to Agriculture, Commerce and Other Vocations; First Book by L. D. Harvey

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**L. D. HARVEY**

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# HARVEY'S ESSENTIALS OF ARITHMETIC

With Everyday Problems Relating to Agriculture,  
Commerce, and Other Vocations

## FIRST BOOK

BY

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## PREFACE

THIS book is divided into three parts, presenting work for the second, third, and fourth years.

Part I, designed to cover the second year's work, is devoted to the counting of numbers to 100 and to the forty-five facts in addition and the corresponding facts in subtraction. In classes where a book is not desired before the third year, Part I may be used for rapid review.

Part II, for the third year, takes up notation and numeration to 10,000 and addition and subtraction of larger numbers, introducing the processes of carrying and borrowing. It develops also the multiplication and division table of 2's, with its many variations and applications.

Part III, for the fourth year, continues notation and numeration to millions, completes the multiplication and division tables, and gives formal work in multiplication and long division, as well as simple exercises involving easy fractions and mixed numbers.

United States Money, Making Change, Telling Time, Drawing to Scale, and the Measures,—inch, foot, yard, pint, quart, peck, gallon, etc.,—are introduced at the points where the pupils are best prepared to deal with them.

The main purpose of the book is to secure accuracy and speed in the handling of numbers and sureness in the interpretation of such problems as come within the range of the child's experience. The interests of children at home and at school, however, suggest various applications of numbers to general problems of a prevocational character, such as

problems relating to agriculture, commerce, manual training, and household arts. Such problems have been used, wherever practicable, to stimulate the child's interest, in place of the more common problems of the old-time primary arithmetic, dealing with dolls and blocks and marbles and tops and perhaps too exclusively with dollars and cents.

After the primary combinations and the simpler operations are once mastered, the book presents each subject in its entirety, with enough drill to drive it home.

Attention is also called to the following features:

1. The work is carefully graded. Each new exercise is closely related to what has gone before; and the new thing to be taught is clearly emphasized.

2. As the abstract reasoning required in the explanation of the basic processes does not aid young pupils in the mastery of such work, it is reserved for a maturer age.

3. The importance of self-activity is recognized in asking the pupils to frame problems for themselves and to draw and cut out figures that help toward the comprehension of number relations.

4. Suggestions to teachers are scattered throughout the book wherever they may serve useful purposes.

5. The exercises for both oral and written work, including abstract and concrete examples, are abundant and varied.

6. The reviews are frequent, cumulative, and thorough. While the exercises are strong enough to test the pupils' power, they are not so hard as to cause discouragement or fatigue.

7. Problems without numbers are given to train the pupils to decide what each problem calls for, and how it may best be attacked, before they perform the operations. Such work strengthens the power of reasoning and develops habits that will be invaluable in subsequent work.



## SUGGESTIONS

BEFORE beginning any recitation, the teacher should bear in mind the following four fundamental propositions:

- (1) Each lesson should have a definite purpose.
- (2) The teacher must clearly realize what must be known and done to accomplish this purpose.
- (3) The teacher must consider how much of this material the pupil has already mastered.
- (4) The teacher must then determine what the pupil has still to learn and how the known may best be related to the unknown.

The first condition essential for the intelligent use of an arithmetic by pupils is that they shall be able to read it intelligently. It is well, therefore, before a lesson is assigned, especially in the first book, to require an oral reading of what is to be learned, and to question closely to see whether the matter read is understood; then to assign definitely what the pupil is to memorize and whatever else he is required to do. If the pupils are trained to read the lessons readily, intelligently, and with good expression, the exercise has a distinct value as a reading lesson, paves the way for a thorough preparation of the new lesson, and materially increases the pupils' power to understand and use arithmetical language.

The teacher should be sure that the meaning of new and unusual words and expressions is understood by the pupils before they undertake the mastery of the lesson.

A new topic is frequently introduced by what is called the "Study Recitation." The matter under this heading should be mastered by the pupils under the immediate direction and stimulation of the teacher. The teacher should always thoroughly master the treatment of the subject matter under the "Study Recitation" in advance, and should be able to give the illustrations and applications without reference to the book, and to extend or modify them as may be found necessary. These exercises are given where special preparation for further work by the pupils is deemed necessary. The time required for such preparatory work is time saved, even if an entire recitation period is necessary, because the pupils will do the following assigned work more intelligently, with greater interest, and more rapidly than would be possible without such preparation.

Training in the statement of arithmetical facts, conditions, operations, and relations, correct in matter and form, should be carried on throughout the study of the subject, the requirements in this respect being adapted to the pupil's capacity. Definitions are statements of fact, and rules are statements of processes and of operations involving these processes. Unless the pupil can improve upon the form of these statements, he should learn them and make them a part of his arithmetical vocabulary.

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