

**A WORK-BOOK IN
ARITHMETIC:
GRADE FOUR**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649496846

A Work-Book in Arithmetic: Grade Four by Lincoln Owen

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Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

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PUBLISHED BY
MANSFIELD PRINTING COMPANY
319 COLUMBUS AVENUE
BOSTON, MASS.

PAID 119.17.665
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PREFACE AND SUGGESTIONS

The title, "A Work-Book in Arithmetic," has been adopted to indicate the general purpose of this book, which is designed for use in Grade IV as a basal text-book.

The book is divided into three parts:

Part I includes an abundance of simple abstract work appropriate to the grade.

Part II includes concrete problems, illustrative solutions, reading exercises, and the tables of denominate numbers.

Part III includes exercises that are suitable for monthly tests.

This plan of arrangement makes the individual teacher, who knows the attainments and deficiencies of her class, the judge as to the amount and type of abstract work that shall be taken at any particular time.

In the opinion of the author, six pages of this concrete work can be mastered per month together with the assigned monthly tests and leave an abundance of time for abstract work.

The tables of addition, subtraction, multiplication, and division are not printed in the book, but it is expected that they will be revived, re-taught, if necessary, and used.

The tables of denominate numbers are printed with abbreviations only, as this is the form in which these terms appear in problems. In all modern arithmetics it is the custom not to pluralize abbreviations in the printed forms.

The illustrations are printed for use and not simply to decorate the page.

Exercises have not been labeled as sight, or mental, or written, or oral, because most sight exercises should be worked as follows:

1. Orally, where the pupils read the questions and answer them under the guidance of their teacher. All errors are immediately corrected by the class and the teacher working together.

2. As a written exercise, in which each pupil reads his own questions and records the answers on a slip

3. As a written exercise, in which the teacher reads selected questions and, at a given signal, the pupils record their answers.

All descriptive portions of the book should be read and the meaning brought out by questions.

During the first part of the year all problems should be read and interpreted before they are assigned to the class for solution.

It will be found that many exercises which are too difficult for class assignment can be used very successfully as cooperative exercises. Some of those exercises are so labeled in the text.

In teaching a difficult process a cooperative plan of work is very serviceable. The following are the common types of cooperative work :

1. The teacher works at the board, while the pupils watch the work, answer questions, and contribute suggestions.

2. The teacher works at the board, while the pupils answer questions and work at their desks.

3. Some pupil works at the board, while the pupils work at their desks.

4. The pupils all work at their desks as the teacher dictates, or makes suggestions, or asks questions.

In explaining problems, pupils of this grade should, in the main, be allowed to use their own forms of expression. Any form of expression which shows that a pupil understands a problem should be accepted. The two simple types of analysis that are presented in the book should be used as forms of explanation.

The work in common fractions and in decimals should be largely oral and concrete, and much of it should be done cooperatively with the fraction board or at the blackboard.

In this grade it is desirable to provide as much concrete work as possible and to encourage out of school activities from which pupils acquire experiences that are essential to the understanding of arithmetical problems. As simple suggestions the following may be named :

1. Playing store in school and at home.
2. Playing dominoes at home.
3. Counting objects up to fifty; such as sets of books, blocks of paper, sheets of paper in a block, packages of cards, etc.
4. Recognizing by touch the pound, the ounce, and more or less.
5. Recognizing the second, by the rate of giving answers; the quarter of a minute, by holding the breath.
6. Estimating distances and quantities; verifying the estimates.

SUGGESTIONS UPON THE DRILL WORK OF PART ONE

Well selected exercises that are fitted for individual assignment as well as for class use enable the pupils to acquire a reasonable degree of proficiency in abstract work in the shortest possible time and thus leave an adequate amount of time for concrete work and teaching exercises.

In grade four, not more than two fifths of the time allowed for arithmetic should be given to abstract work.

Any pupil of grade four who is up to grade should get at least four out of every five of these examples correct at the first trial.

By midyear these examples, except in long division, should be worked, on the average, as fast as two per minute.

The pupils should frequently work under a time limit with a comparison of answers at the end of four

or five minutes. By beginning at different points a single form will furnish drill material for several days.

Such a form as No. 12 should be used repeatedly in the early part of the year as the means of finding the causes of failure and as a type of "practice on single figures" that is far more serviceable than a recitation of tables.

The following are some of the ways of using cards No. 12 and No. 42.

1. Have several pupils give five answers each.
2. Go around the class, each pupil giving one answer.
3. Time several pupils for fifteen seconds each. Aim to secure even speaking at the rate of one answer per second.

Such forms as Nos. 4, 6, 9, 10, etc., that require pupils to transfer numbers and arrange them, furnish a most excellent training in carefulness.

The pupils should be trained to exchange papers and mark answers. When this is to be done, they should all work with pencils and all mark answers with pens or the reverse.

While marking answers, no discussion should be allowed and no explanations given. It is economical to have one pupil read as many answers as he can correctly, or at least read a considerable number before changing to another reader.