HOW TO TEACH THE METHOD OF UNITY

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How to Teach the Method of Unity by Alfonzo Gardiner

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ALFONZO GARDINER

HOW TO TEACH THE METHOD OF UNITY

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HOW TO TEACH

THE

METHOD OF UNITY.

(CODE 1883; SCHEDULE I, ARITHMETIC.)

An Exemplification of the Method, with its Practical Application to the Arithmetic of Standards IV to VII, and of Pupil-Teachers. Illustrated by Numerous Examples fully worked out, with Hints to Teachers, and Specimen Notes of Lessons.

BY

ALFONZO GARDINER,

THIRD EDITION, REVISED AND ENLARGED

JOHN HEYWOOD,
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PREFACE TO FIRST EDITION.

AMONGST other great improvements the New Code of 1882 stipulates, in Schedule I, Arithmetic, Standard V, that the teaching of Rule of Three is to be by "The Method of Unity."

Thoughtful teachers have for a long time been dissatisfied with the ordinary method of "statement." It is true *results* are arrived at by its use, and children of fair ability have had no difficulty in attaining a certain *mechanical accuracy*, but without any thorough knowledge of the method by which the results have been obtained. The great aim in the teaching of Arithmetic is not so much to provide the children with a certain number of mechanical devices by which special questions are to be worked, as to improve the *reasoning powers*. The ordinary method of "statement" fails to do this, as the theory of Ratio and Proportion is far beyond the capacity of children, and requires, for its thorough comprehension, a fairly mature and well trained mind.

The Method of Unity, or working by "First Principles," as it is often called, is simplicity itself. It can be easily understood by even a dull child, and it is scientifically accurate. One reason why it has not been more used is on account of the difficulty children find in *arranging* the work so as to make neat and tidy papers for the Inspector's keen eye. This difficulty is here met by one or two simple plans of arrangement, which the author has used for the last ten years with unvarying success. As to the method itself, teachers who already know it will find little that is new, excepting the plan of arrangement. The application of the method to Simple and Compound Proportion, Interest, Percentages, Discount, and Stocks (see Schedule I, Standards V to VII) here exemplified will be sufficient to show to the practical teacher the wide range over which the method may be applied, and the manner of treating simple as well as more complicated problems. Nearly all the exercises in "John Heywood's Complete Series of Home Lesson Books," in the above mentioned rules (together with numerous other typical examples), are worked out in full.

ALF. GARDINER.

Little Holbeck Board School, Leeds,
July, 1882.

PREFACE TO THIRD EDITION.

THE rapid sale, in less than a year, of two editions of this little work shows that it has met a want.

Advantage has been taken of the issue of a third edition to considerably enlarge the book. Appendix I. contains solution of all the questions (to which the method is applicable) in "John Heywood's Complete Series of Home Lesson Books," Standards V. and VI., which are not worked out in the body of the work. References by number are made in the answer books to the various questions.

Appendix II. gives very neat and concise directions for *stating* Rule of Three, single and double. They were drawn up some years since by the Rev. J. W. W. Drew, of St. Edward's, Romford, and are so clear and distinct, and presented in such a handy form, that young teachers will no doubt find them a great help with dull children. To pupil-teachers drawing up notes of lessons they supply just what is wanted to show the train of reasoning. Our best thanks are due for readily granted permission to make use of them, and though they give little help towards understanding the "Method of Unity," no apology is necessary for their introduction, since the *Instructions to Inspectors* state that "if the answers are correct, and have been intelligently worked by either method, you will, of course, accept them."

The early part of the book has been made much clearer, and in the body of the work a number of more complex questions have been incorporated (see Nos. 64, 65, 66, 67, 68, 69, 93, 94, 108, 123, 124, and 134). Several typical "Stock sums" are added to this section of the book (see Nos. 142, 143, 145, 148, 149).

It has been objected against the method of arranging Double Rule of Three here presented, that the work loses its educational value, and becomes a merely mechanical exercise. This objection is groundless, as exactly the same train of reasoning is gone through in forming the final fraction only, as in building up several fractions line by line. In Appendix I. the examples are alternately worked by the long and the short methods, so that teachers who prefer the former may have it fully illustrated.

ALF. GARDINER.

Little Holbeck Board School, Leeds,
June, 1883.

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HOW TO TEACH

THE METHOD OF UNITY.

1. The Method of Unity is frequently called working by "*First Principles*," because a knowledge of "the first principles," or fundamental rules of arithmetic alone is sufficient for the solution of simple problems, and every problem, no matter how complicated its appearance, reduces itself finally to cases of multiplication and division. It is also known as the "*French method*," because great use is made of it in the teaching of elementary arithmetic in French schools.

2. Explanation of Terms.—All arithmetical questions, to which this method of working is applicable, however complicated their form, will be found to consist of *two parts*—

(1) the *statement*, which is often a *supposition*,

(2) the *demand*, or question to be solved.

3. Before proceeding to find the thing demanded, the statement, or supposition, is *reduced to unity*—hence the name, "The Method of Unity, or The Unitary Method," applied to this particular manner of working out various forms of arithmetical problems included under the comprehensive terms of Ratio and Proportion. Many others, which range themselves under no particular rule, can also be worked out by the same method.