

**THE NORMAL COURSE
IN NUMBER. FIRST
STEPS IN ARITHMETIC**

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The Normal Course in Number. First Steps in Arithmetic by Ella M. Pierce

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ELLA M. PIERCE

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STEPS IN ARITHMETIC**

The Normal Course in Number

First Steps in Arithmetic

BY

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SUGGESTIONS TO TEACHERS.

THIS book is intended for the use of children of the second school year, and covers the fundamental processes through numbers to twenty. Both in the selection and sequence of subject matter the order of the development of the number sense in children has been carefully considered. In the development of the lessons, care has been taken to insure a clear perception and a firm grasp of the number facts which are the tools of all arithmetical work, and to develop the power to see both with eyes and mind the relations of quantities to each other, which is the basis of the power to apply knowledge.

The lessons are of three kinds, — those not intended for the children at all, but meant as suggestions of method for the teacher, in introducing a new subject; those which are to be used by the children after preparation by the teacher; and those which may be taken at once by the class.

To the first class belong the lessons teaching tens and ones, the first lessons in measures of all kinds, and the lessons directing the children to work, — draw, cut, lay tables, etc.

To the second class belongs a part of the lessons illustrated by tablets, measures, fractional parts, etc. When such lessons introduce a new *principle*, they should be preceded by a concrete lesson of instruction without books. When, however, they teach only new *facts* illustrating principles previously taught, they may be taken at once by the class.

To the third class belong all lessons which are applications of facts and principles already taught. Here the children should be left free, as only by making their own applications do they gain the power and the habit of making use of knowledge. If pupils fail in the problem work, it is due either to incompleteness of knowledge of facts or principles, or lack of power to image conditions and see relations. In the first case they need more instruction and practice of the kind which precedes the problems, and in the second case they should themselves diagram the conditions to strengthen the power to picture them.

MATERIAL.

The knowledge of both number facts and relations of quantities should have a concrete basis, but the material should vary according to the nature of the truth to be developed. Mere number facts — addition, subtraction, multiplication, division, fractional parts, and relations of numbers — may all be easily taught with the simplest objects, but the greatest use of these number facts in life is to represent relations of quantities. It is the lack of mental power to see these relations of quantities, and fit to them the corresponding relations of numbers, that prevents children from knowing whether to add or subtract, multiply or divide. It is, therefore, necessary that this power should be developed side by side with the power to manipulate figures. Dry and liquid measures, long and square measures, rectangles, and blocks offer the best possible material for this purpose. Each school should be provided with the measures, and their values and relative values should be taught with the objects themselves and not with pictures. The use of pictures is to represent and recall, not to replace the objects.

REVIEWS.

In the development of each new subject, great care has been taken to introduce in abundance the facts previously taught, and in such a manner as to provide for their retention without tedious repetition and without interfering with the prominence which should be given to the new. The addition examples given just before leaving 11, 12, etc., review all additions already taught if added from the bottom upward. If they are used by the teacher as dictations, they should be given in the same order.

WRITTEN EXERCISES.

Ample provision has been made for the written work of the children in the belief that it is far better for children's eyes to work from book to paper or slate than from blackboard, and in the hope of saving the teachers much blackboard work. Most of the written work should be first read in the class to insure its accuracy. At this age children do not need to write to show the teacher what they know, — that all comes out in the class work, — but to practise putting down what they know, neatly, accurately, and with increasing rapidity. Many of the written exercises should be finally used as dictations.

WORK OF THE FIRST YEAR.

It is supposed that pupils beginning this book have had some number work in the first year. This work should be of the broadest, simplest, and most informal kind, conforming to the child's own ideas. The power to count goes far ahead of the ability to recognize the number of objects in a group, and that in turn precedes the power to recognize the groups in a number. Comparison for difference precedes the idea of comparison for proportion. Formal statements of number facts are not natural to children at any time, and should not be imposed upon them until long familiarity with the fact gives life and meaning to the statement.

The number lessons in the first school year should be conversational exercises in which the children count the objects present, — children, chairs, window-panes, pencils, etc.; count abstractly; recognize numbers in groups not exceeding ten; separate numbers not exceeding ten into two groups; measure lengths in yards, feet, and inches; build lengths not exceeding a foot with inch, two-inch, three-inch, four-inch, five-inch, and six-inch sticks; compare groups and lengths for differences; build rectangles with square inches; learn the names of halves, thirds, and fourths; and compare lines, surfaces, and numbers for proportion as children are able to comprehend.

No figure or written work is desirable during the first year. Drawing, cutting, and laying material can be used to advantage.

E. M. P.

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1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in financial matters. The text notes that without clear documentation, it becomes difficult to track expenses, revenues, and other critical data points.

2. The second section addresses the challenges associated with data management and storage. It highlights the need for secure and scalable solutions to handle large volumes of information. The document suggests that investing in robust IT infrastructure is crucial to ensure that data is protected from loss and remains accessible when needed. Additionally, it mentions the importance of regular backups and disaster recovery plans.

3. The third part of the document focuses on the role of technology in streamlining operations. It describes how automation can reduce manual errors and increase efficiency across various departments. The text also touches upon the importance of staying updated with the latest technological advancements to maintain a competitive edge in the market.

4. The fourth section discusses the importance of collaboration and communication within an organization. It stresses that effective teamwork is key to achieving common goals and overcoming challenges. The document suggests implementing clear communication channels and fostering a culture of open dialogue to enhance productivity and morale.

5. The final part of the document provides a summary of the key points discussed and offers some concluding thoughts. It reiterates the importance of a holistic approach to organizational management, where all aspects from record-keeping to technology and communication are integrated for optimal performance. The text ends with a call to action, encouraging readers to take the necessary steps to implement the discussed strategies.

First Steps in Arithmetic