

lesson in reading cannot be over-estimated. Of course the object lessons afford an excellent opportunity for language lessons, but the pictures even in our own primers are more suggestive to children than objects usually are.

Blackboard and Slate Work. It is scarcely necessary to state that the teacher is advised to use both the blackboard and slate in connection with the primer and tablets. The blackboard is of more use in teaching a child to read than the best tablets and primers combined, if it is used properly.

MENTAL ARITHMETIC. IV.

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METHODS.

(1) *First Notions of Numbers—Counting.*—As “a good beginning is the half of all,” it is of the highest importance that the child should acquire at the outset clear ideas of numbers, and of the processes involved in the fundamental rules. And further, as our first ideas of numbers are derived from objects of sense, elementary lessons in the science of numbers, as already affirmed, should be given with visible objects. Any objects, as books, pencils, &c., may be used; but for effective use, the *Numeral Frame* is by far the most convenient, and it is hoped that no school in the Dominion is without this simple but essential aid in teaching elementary arithmetic. The youngest child found at school will probably have formed ideas of some of the smaller numbers, though as yet he may know nothing of their names. He may not, for example, have the faintest notion of what is intended to be expressed by the words *two* and *four*; but give him his choice between *two* apples and *four* apples by actually presenting these objects before his eyes, and his prompt decision proves that he has already formed some conception of numbers. Still, as little progress in thought can be made without the use of thought-symbols, it is plain that the child's conception can embrace only very small numbers, and that, from inability to analyze the concept into its elements, his notions are necessarily exceedingly crude. His school-room work, then, in connection with arithmetic, begins with the COUNTING OF OBJECTS; there is first the presentation of visible objects to impart clear notions of numbers, and secondly, the naming of these notions that have been thus clearly, because naturally, formed.

The mere naming of the numbers in consecutive order (*one, two, three, &c., &c.*), without attaching any meaning to the names as representing a certain number of units, is a process by no means rare in the school-room, though it is all but absolutely useless. We know children that can “count” readily as far as fifty, or even a hundred; but ask them to move nine balls on a wire, or place twelve marks on a slate, and if they make the attempt at all they will sadly blunder. Such counting as this, without any reference to the numbers or groups of objects which the names represent, is as worthless an expenditure of time and energy as learning to rush through the names of the letters from A to Z without ever seeing the forms which the names stand for. What then is the true method? We suppose that all know it, though all do not follow it.

(a) Let the teacher, holding up one book, ask the class “How many books do I hold in my hand?” They will answer—or if they do not know they must be taught to answer—one book: in the same way the teacher proceeds with *one* pencil, *one* finger, *one* ball, &c., till his pupils have a clear notion of what the word *one* stands for. Then he proceeds in a similar way with *two* pencils, *two* books, *two* balls, &c., till they know clearly how many objects

the word *two* stands for. And so the teacher goes on, first presenting the groups of objects in the order of the consecutive numbers (*one, two, &c.*), and then in varying order (*three, five, seven, two, four, six, &c., &c.*), till his pupils can not only count from one to ten, but can instantly name any number of objects from one to ten inclusive which the teacher may place before them, and conversely can instantly count off or select the number of objects expressed by any name which may be given them.

There is a difference of opinion among experienced teachers as to what is best to be done after the pupils are thoroughly familiar with the numbers from one to ten. Some prefer to continue the process of counting till larger numbers are mastered; others think it desirable to give the notation of the numbers already learned. Either course may perhaps be followed with advantage.

(b) From our own experience, however, we are inclined to teach next the *analysis* of the numbers already acquired, in order that the pupils may attain still clearer notions of the values of the numbers, as exhibited in their relations to unity and to one another, while at the same time they are made familiar with some of the operations of the fundamental rules. The teacher, holding up one pencil, asks “how many pencils have I in my hand?” The pupils answer as before, “one pencil.” He then takes another pencil in his hand and asks, “how many have I now?” The answer is “two pencils.” “Then one pencil and one pencil are how many?” Pupils answer “two pencils.” In the same way the teacher shows that one book and one book are two books, one ball and one ball are two balls, &c., &c., till they arrive at the fact that *one* and *one* are *two*. He then introduces them to a different form of expression, showing that instead of saying one and one are two, and two is equal to one and one, we may say *two times* one is two, and two is equal to *two times* one. Then holding up two pencils he asks, “how many pencils have I in my hand?” Pupils answer “two.” He removes one pencil, asking, “how many have I now?” “Then one pencil from two leaves how many?” Removing the remaining pencil, he asks, “how many have I now?” “Then two pencils from two pencils leave how many?” And so on with books, balls, &c. The pupils are thus made familiar with the meanings of the following facts and expressions: one and one are two, two times one is two, one from two leaves one, two from two leaves nothing, two contains one *two times*, one is contained *two times* in two. The teacher then gives some practical problems, as e.g.: I gave one pencil to Harry and one to Willie, how many did I give away? Charles had one cent and Willie had one cent, how many had both together? Charles had two glass alleys, he gave one to his brother, how many had he left? Susie has two cents, and buys pencils which cost one cent each, how many pencils does she buy? I have two pencils, and give one each to a number of boys, how many boys will receive a pencil? And numerous similar questions may be given in addition, subtraction, multiplication and division, until the pupils are familiar with the notions they involve. The teacher then proceeds to a similar analysis of the number THREE. One ball, and one ball and one ball are three balls; two balls and one ball are three balls; one ball and two balls are three balls; one ball from three balls leaves two balls; two balls from three balls leaves one ball; three balls equals three times one ball; one ball may be taken three times from three balls. And so on with books, pencils, &c., till all the ideas involved are clearly mastered. Then, as before, practical questions may be given. John had three apples and gave away two, how many had he left? Mary had two pins and found one more, how many had she then? I gave one cent to each of three boys, how many did I give away? Charles had three peaches, he gave one each to some class-mates, how many class-mates re-