

**A PRIMER OF NUMBER: A
TEACHERS'
MANUAL FOR FIRST
AND SECOND GRADES**

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A Primer of Number: A Teachers' Manual for First and Second Grades by Frank Rigler

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A TEACHERS' MANUAL FOR
FIRST AND SECOND GRADES

By

FRANK RIGLER

FORMERLY SUPERINTENDENT OF CITY SCHOOLS
PORTLAND, OREGON

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PREFACE

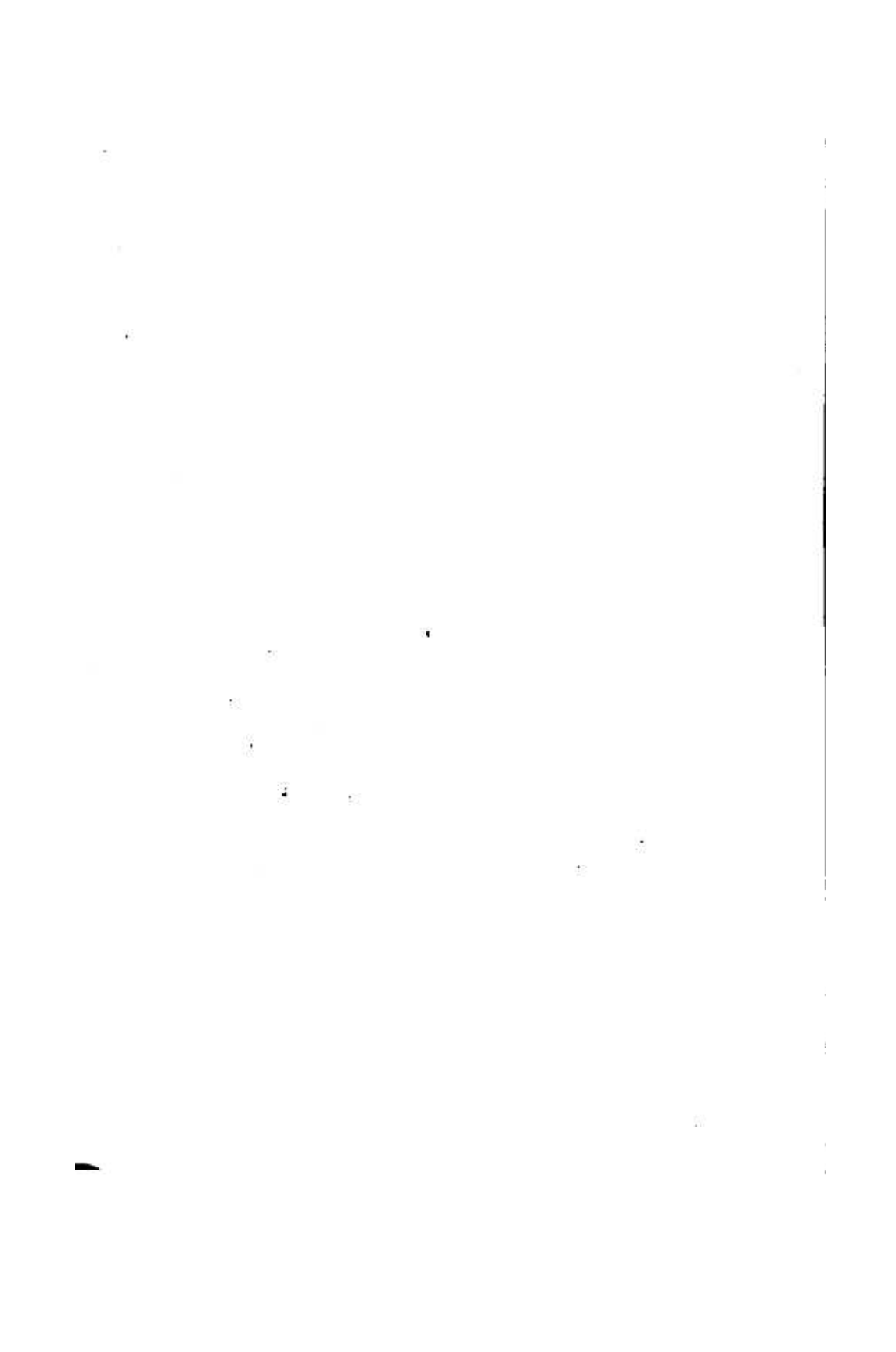
Most methods of teaching primary number make the purpose of the first year's work the memorizing of the so-called forty-five facts of addition and subtraction. This is dry and difficult work for young children, and results in such a dislike for the subject that in not a few places number work has been discarded from the course of study of the first school year. Some go so far as to say that children should not be given concrete problems to solve earlier than the fourth year of school, because they are unable to do the reasoning required for the solution of such problems. If concrete problems are to be solved by *verbal* reasoning the argument is not without force; but the writer believes that verbal reasoning has no place in the early solution of arithmetical problems.

Six-year-old children like to count. This impulse should be used as the means of developing their number sense. Counting is the fundamental operation; all computation is derived from it, and may be made ultimately to displace it, the *remembered modes of counting* being finally used only to determine by what operation the problem under consideration is to be solved.

The first year's number work then, consists in counting objects grouped in various ways, and in making numerical records of such groupings. Children delight in doing this, and achieve such results as sometimes seem incomprehensible to those not familiar with the method. It is believed, however, that a careful reading of this book will convince primary teachers that the method follows the child's natural development in number power, and that the means employed are pedagogically sound.

PORTLAND, OREGON.
July, 1913.

FRANK RIGLER.



A PRIMER OF NUMBER

PLURALITY AND NUMBER DISTINGUISHED

A group of similar objects, (say marbles), possesses the attribute of plurality. We may say of it, "There are a *few* marbles," or "There are *several* marbles," or "There are *many* marbles."

A second group of the same kind of objects may differ from the first group in its degree of plurality; yet we may be able to make the same assertions of it that we made of the first group.

Each degree of plurality has a particular name, the lowest degree being called "two," the next "three," the next "four," etc. These names, when memorized in their proper order, constitute a mental scale by which the degree of plurality of any group of separated objects may be measured, (i. e., ascertained).

The process of measurement is called "counting," and consists of a "one-to-one" application of the words of the scale to the objects of the group. The word of the scale applied to the last object of the group names the group's degree of plurality. (See "To Teach Counting," page 6.)

Our *notion* of the group before counting is called *plurality*; our *notion* of it after counting is called *number*.

Therefore, *Number is measured plurality*.

I. TO TEACH COUNTING

When children enter school they have some comprehension of degree in plurality and some knowledge of the names of different degrees. This knowledge needs to be clarified, fixed, and extended. The following points require attention:

First. A new number name, as "six," should always be given in the presence of a group of objects of the degree of plurality indicated by the number.

Second. What is commonly called "counting without objects," i. e., uttering the words "one," "two," "three," etc., which name the different degrees of plurality, is a useful exercise, provided that no new number words are presented in this way. The teacher should understand, of course, that this is not counting, but is simply making pupils ready and facile with the word series which constitutes the scale used in measuring degrees of plurality.

Third. The errors of pupils arise from two causes: (a) imperfect knowledge of the word series "one," "two," "three," etc.; (b) failure to make a "one-to-one" application of this word series to the group of objects counted. The erroneous application may be either "one (word) to two (objects)," as when

the pupil touches two objects while saying "three," or it may be "two (words) to one (object)," as when the pupil utters the words "two," "three," while touching one of the objects counted.

CORRECT COUNTING

(Consisting of a one-to-one application of the words of the scale to the objects counted)

WORDS OF SCALE: "One";	"Two";	"Three";	"Four";	"Five".
OBJECTS COUNTED: ○	○	○	○	○

ERRORS IN COUNTING

First. The pupil does not know the scale.

WORDS OF SCALE: "One";	"Two";	"Three"	"Four"	"Six"
OBJECTS COUNTED: ○	○	○	○	○

Third. One word is applied to two objects.

WORDS OF SCALE: "One";	"Two";	"Three"	"Four"
OBJECTS COUNTED: ○	○	○—○	○

Second. Two words are applied to one object.

WORDS OF SCALE: "One";	"Two-three";	"Four"	"Five";	"Six".
OBJECTS COUNTED: ○	○	○	○	○

Fourth. Careful distinction should be made between the following two general modes of counting:

(1) Ascertaining the degree of plurality of a given group.

(2) Constructing a group of a given degree of plurality.

This distinction will be made clear by the following simple examples:

(a) Teacher hands the pupil five pencils and asks him how many she has given him. Pupil counts them and answers, "Five."

Notice that the teacher constructed the group, and the pupil ascertained its degree of plurality.

(b) Teacher sends the pupil to a box of pencils with instructions to bring her five.

Notice that the degree of plurality is here given the pupil, and he constructs a group possessing that degree.

The latter mode of counting is more difficult than the former, because in the former the pupil has simply to apply the word series to the constructed group of objects, while in the latter mode he must, at the same time he is making this application, keep in mind the word of the series with which he must stop.

Fifth. The material upon which counting is practiced should be carefully graded, as follows:

(1) Count objects both seen and touched.

(2) Count objects seen but not touched.

(3) Count sounds, as how many taps are made by some one not seen, or how many sounds in a slowly uttered word.

(4) Count repetitions of an act, as how many times a pupil crosses the room.