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# Teaching Children How to Read Mathematics

by

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Reading the materials of elementary school mathematics is so specialized that a child must be taught how to do the reading. In mathematics, ideas are communicated by using a special language. Some sentences may be vocalized using the word attack skills needed for ordinary written English. Other sentences cannot be vocalized using these skills because they contain more than alphabetical signs. An example of a sentence containing a mixture of alphabetical and mathematical signs is given below.

Addition is associative on the set of whole numbers, that is,  
 $(2 + 3) + 4 = 2 + (3 + 4)$  since  $5 + 4 = 2 + 7$ .

Conversions of mathematics symbols such as 2, 3, 4, +, and = into words must be learned. The child must also know the meaning of other symbols, for example, [ ], X, >, <, ≠, √, √, ε. In addition to learning the symbols, the child must learn many abbreviations, such as mo., t., min., hr., lb., doz., gal., and in. Learning the symbols and abbreviations constitutes a reading task. When a child is experiencing trouble, care should be taken in ascertaining whether it is because he does not know how to do the mathematical operation or does not know the symbolism of mathematics.

The language of mathematics contains words which are specific to mathematics, such as multiplicand, numerator, denominator, addend, perimeter, rectangle, rhombus and sphere. Words of this type are part of the reading equipment necessary in reading the usual mathematics book. The best way to teach such specialized terms is through their informal use. The teacher calls the concept by its specific name as he goes about his instructing. The language of mathematics also contains words which have one meaning in mathematics and another meaning which is not mathematical, for example, set, table, plane, point, power, yard, intersection, line and square. Words with more than one meaning cause problems for children because the non-mathematical meanings are used in everyday experience and are more familiar to them. Consequently, they have a tendency to resort to non-mathematical meanings even when reading in a mathematical context. If the meaning is to be clear in any given case, then the words having more than one meaning need to be studied in context. The teacher should anticipate difficulties and give the child the specialized interpretation.

The arrangement of words on a page in ordinary English is from left to right and is said to be linear. In mathematics, the arrangement of words and symbols is not necessarily linear. In the expression  $5^2$ , the motion from 5 to  $^2$  is diagonal,  $5^2 \nearrow$ . In the expression  $1/3 + 1/4$ , the ordering is shown by the following pattern:  $\downarrow \frac{1}{3} \nearrow + \downarrow \frac{1}{4}$ . In reading ordinary English, children learn to move smoothly from the end of one line of print to the beginning of the next. In mathematics, difficulty in reading is increased as the number of moves increases within a given line and in going from line to line. To help children read mathematical selections smoothly, pick out passages from the textbook. Allow each child to read a passage silently, then check by having each child read the passage aloud. This will help to identify trouble spots in reading order, and instructions can take place which will help clear up the difficulties.

One form of mathematical expression, the story problem, is especially difficult for children. Insofar as reading procedure is concerned, the following steps are widely prescribed on problem solving:

1. Rapidly read the problem to get a general impression; visualize the situation; ascertain what students are to find out.
2. Reread to get facts, isolating those facts which are pertinent to the solution.
3. Reread to help in planning the steps for solution. Some authorities have students state the situation in a mathematical sentence, while others have them estimate the answer and then perform the necessary numerical computation.
4. Read the problem again to check the procedure and to see if the solution is a tenable one.

Thus, several readings are entailed in properly approaching problem solving in mathematics.

The preceding paragraphs set forth some procedural suggestions for teaching reading in mathematics. All teachers should be reading teachers regardless of their content specialization. The reading teacher specialist can effectively work on content skills, but the only place to teach the reading pertinent to a content area is in the class dealing with the material. Teachers of self-contained classrooms in the elementary school must be committed to the fact that reading instruction must go on all day in every subject area.

## Bibliography

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