
Tips for Teachers

by

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Whether or not a teacher spends time instructing students in the broad area of reading in mathematics, inevitably some students still experience difficulties in one or more of the numerous specific areas. It is the responsibility of the teacher to diagnose in detail the area(s) in which the student is having problems. Then he must apply some concrete techniques to alleviate the difficulties.

The following is a list of suggestions that may be used by a teacher to aid in overcoming a student's problem(s).

1. TECHNICAL WORDS

These are often a problem for the child because he does not understand them or there are too many in a given passage.

If there are numerous technical terms to be encountered, either be sure that the student understands what their meaning is, or avoid that particular problem. The following is a method used to decide if the word problem should be eliminated: "If a given problem averages more than one unfamiliar word per 20 running words of print (5 percent unfamiliar; 95 percent familiar), it may be difficult for the average student to attack that problem."¹

2. OCCASIONAL VOCABULARY WORDS

If there are one or two words in a problem that may create confusion, the meaning of such words should be clarified before the assignment is given.

3. WORDS WITH MULTIPLE MEANINGS

"The teacher should be aware of problems that contain words having one meaning in literature and another in arithmetic. He should be prepared to give a vocabulary lesson immediately prior to the arithmetic assignment."²

¹Leroy Barney, "Problems Associated with Reading of Mathematics," *The Arithmetic Teacher*, Volume 19 (February 1972), p.132.

²*Ibid.*

An idea that can be put to use in your classroom is to have each child keep a book in which new mathematical terms are recorded, as well as their meanings. This gives the child a reference which he can refer back to.

Another idea that could be used along with the above suggestion is to keep a math dictionary in the classroom which the students can refer to if they are not sure what a particular word means.

4. NARRATIVES WITH UNNECESSARY OR INSUFFICIENT DATA

Have the child read these aloud, and then discuss what is given and what is required, and from here whether there is unnecessary or insufficient data. A great deal of work usually needs to be done in this area, since many students fall prey to problems with unnecessary or insufficient data. These types of problems can be used "... with discretion to determine how well the child is able to use his reading skills at the interpretive or analytical level."³

5. STUDENT RESTATEMENT

Time should be allowed the students to orally restate a problem in their own words. This is a way for you, the teacher, to check whether the student understands the vocabulary and ideas presented, and gives the student a chance to introduce a little humor into the usually dry, humorless word problem.

6. PUNCTUATION

Occasionally punctuation marks in math books may represent uses different from those in an English text.

For example: The girl ran into the room and hollered at her dad,
"Take care of yourself and enjoy ..."
(1, 2, 3, 4,)

As the math teacher then, you must reteach and reapply the use of punctuation in mathematics.

7. As the class comes across an abbreviation, the meaning and its origin should be explained, that is, their Latin and Greek roots, for example, lb. and oz.

8. PREFIXES AND SUFFIXES

The teacher should teach the student the most-used prefixes and suffixes and what they mean, for example, poly - many, di - two.

9. READING SPEED

"A mathematics book should in general be read slowly, but there are times when more rapid reading is advisable. Children should be encouraged to combine both types of reading... The following steps may help children read... at the appropriate rates:

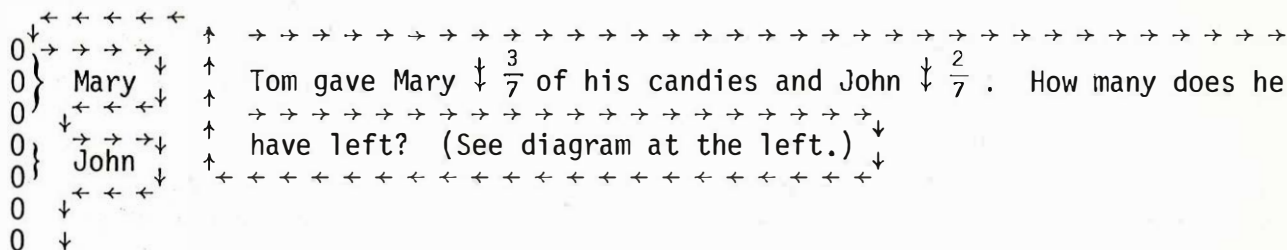
- (a) Read the selection rapidly to determine what it is about.
- (b) Reread slowly to see how ideas are related.

³Leroy Barney, "Problems Associated with Reading of Mathematics," *The Arithmetic Teacher*, Volume 19 (February 1972), p.132.

- (c) Ask the question: Did you follow all the directions and answer all questions?"⁴

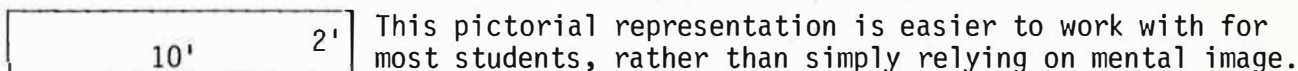
10. ORDERING SYMBOLS

In any English text, a person reads from left to right, horizontally across the page ($\rightarrow \rightarrow \rightarrow \rightarrow$). In mathematics, however, a person may end up reading horizontally, vertically, from the top of a page and skip to the bottom and then back to the top of the page. A child must be taught how to read the page, and the order in which it is read. For example, one would read $\downarrow \frac{3}{7}$, not $\uparrow \frac{3}{7}$. An example of a question in a text which requires the child's course of reading to jump around is:



11. READING WITH PAPER AND PENCIL

A child should be taught to draw diagrams or charts as he reads the problem through. For example, if a child was reading a problem which stated that a yard was $10' \times 2'$, he should make a diagram looking like this:



12. READING GRAPHIC MATERIALS

Often word problems will refer to graphs or charts. A child must be taught to read these properly. One method would be to have the child skim first for the topic, categories, and elements. Then a detailed study should follow, in order to ascertain the desired facts. It is a good idea to have the class make their own graphic materials in an area which interests them. Also, engage the class in games which require the children to fill in a grid by moving horizontally and vertically.

13. ORAL READING

"Oral reading of mathematics can provide many benefits. A few of these benefits are listed below.

- (a) Students hear the sounds for symbols which have no phoneme-grapheme relations with spoken words.
- (b) Students recognize that different verbalizations can occur for a set of symbols.
- (c) Students see how the meaning of the page parallels the meaning of a lesson presented by a teacher.

⁴Robert B. Kane, Mary Ann Byrne, and Mary Ann Hater, *Helping Children Read Mathematics* (New York: American Book Company, 1974), p.41.

- (d) Students, of necessity, slow down their reading pace.
- (e) Teachers can recognize whether an inability to solve a problem is due to weakness in perception or comprehension."⁵

14. NONVERBAL PROBLEMS

- "(a) Nonverbal problems allow pupils to focus quickly on a problem situation without heavy reliance on advanced reading skills ...
- (b) The nonverbal problem format is very flexible ...
- (c) *Perhaps* the most potent advantage is that the teacher can provide the types of problem situations that come closest to the real-life experiences faced by pupils inside and outside the classroom.
- (d) Nonverbal problems can be tailored to meet the needs of pupils who have special requirements ..."⁶

15. ESTIMATION

By teaching estimation, the student can compare his computed answer with the estimated answer to see whether he has arrived at an answer that is plausible.

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⁵Robert B. Kane, Mary Ann Byrne, and Mary Ann Hater, *Helping Children Read Mathematics* (New York: American Book Company, 1974), p.73.

⁶John W. Trueblood, "Promoting Problem Solving Skills Through Nonverbal Problems" *The Arithmetic Teacher*, Volume 16 (January 1969), p.8.