Ideas for Elementary Math Teachers

At the time of year when we go back to school, teachers wonder whether students remember anything they were taught the previous year. Yet we all realize that we forget a great deal of what we have learned if we do not in some way make continuous use of it. Mathematics is no exception! What do we do with students at different grade levels who no longer can give automatic response to the basic facts in addition, subtraction, multiplication, and division, presuming they once could? Some contend that in a modern program of mathematics one no longer needs to provide students with drill. In my opinion, this is not true. It is a mistake. Surely, drill should not come before understanding. If at all possible, drill should be made interesting, exciting, and challenging so that it might be enjoyable and even fun. If one does not like the word "drill", perhaps one could substitute "sustained attack". Regardless of what word one uses, I think that students of mathematics at all levels need some type of practice as a means of fixing ideas. So let us take new courage and work with a will to have those we teach again attain the goal of being able to give automatic response to the basic facts in the different operations. It is a must!

In this article, I certainly do not claim to have ideas which are entirely new, but I do claim to have helpful ideas which I would like to share with you. I also think these ideas will appeal to you as teachers because they can be readily carried out in the classroom without a great deal of preparation and materials. They are simple ideas! My aim is to suggest some ideas for each of the following three operations.

ADDITION

A teacher might use "skip" addition in various ways. For example, he might tell the students to take the number 9 and keep adding 8 until they reach 129. How the students record this would depend upon the skill they have acquired for addition and the grade level.

Some students may make their record like this:

$$\begin{array}{r} 9 \\ +\ 8 \\ \hline 17 \\ +\ 8 \\ \hline 25 \\ +\ 8 \\ \hline 33 \end{array}$$ and so on.

Others might simply write: 9, 17, 25, 33, 41, 49, 57, 65, 73, 81, 89, 97, 105, 113, 121, 129, or they might record the sums vertically. "Skip" addition often produces beautiful patterns! Have students be on the alert for them. In the above example, notice the digits in one's place in each of the numerals 9, 7, 5, 3, 1, 9, 7, and so on.

To have students require more speed with no loss in accuracy, and hopefully to have them practise on their own outside of school time, a teacher might try this approach. Many teachers have found it successful. Ask the class to take a number, say 18, and keep adding 7. Time them. Let them continue adding for one full minute or whatever time limit you deem appropriate. Then have the entire class stand and recite the answers together. As soon as a student has a wrong answer or no longer has an answer, he should be seated. The student who remains standing the longest is the winner.

Teachers might extend this idea by using "skip" addition with fractions - start with 1/2 and keep adding 1/2. Thus: 1/2, 1, 1 1/2, 2, and so on. Or try one a bit more challenging - start with 1/2 and keep adding 1/3. Why not have students do the same with decimals? The result might just be amazing!

Just one more idea for having students get practice in addition! It is not only interesting but fun. Have the students write the name for some number. Then have them reverse the digits in the numeral that names the number to obtain the name for a second number. Add the two numbers named. Then reverse the digits in the numeral that names the number which is the sum of the first two numbers. Again add the numbers named. Continue this procedure as often as necessary; a number is eventually reached whose name reads the same from both ends. For example, let's try 1971.

$$
\begin{array}{r}
1971 \\
1791 \\
\hline
3762 \\
2673 \\
\hline
6435 \\
5346 \\
\hline
11781 \\
18711 \\
\hline
30492 \\
29403 \\
\hline
59895
\end{array}
$$

If you really want fun, try 98. I would caution any teacher who uses this idea in his classroom to have tried the examples himself previously. Some numbers require many, many, many additions. If the additions do not become too lengthy, teachers might use this idea for races. One way to carry this out would be to select two teams of students. Then let one member of each team work at the board, giving them a certain number; the rest of the class may work the same example at their seats. Each team member endeavors to complete the addition correctly and *first*. The one who does just that earns a point for his team. Why don't you try it with your class? Students do enjoy it!

SUBTRACTION

"Skip" subtraction provides the same practice and patterns as "skip" addition. It can be handled in the same manner.

For example, start with 81 and keep subtracting 7 until you reach 11. It

will look like this:
81, 74, 67, 60, 53, 46, 39, 32, 25, 18, 11.

Or start with 9 and keep subtracting 3/4 until you reach 1 1/2. 9, 8 1/4, 7 1/2, 6 3/4, 6, 5 1/4, 4 1/2, 3 3/4, 3, 2 1/4, 1 1/2.

How about decimal fractions?

Another idea which students find exciting and which can be used in various ways in a classroom is this. Write the names of four numbers in a row, leaving space between (see example below). Take the difference between the first and the second numbers and write its name in the first column; take the difference between the second and the third numbers and write its name in the second column; take the difference between the third and the fourth numbers and write its name in the third column; take the difference between the fourth and the first numbers and write its name in the fourth column. Continue finding the difference in this manner. Eventually a point will be reached where the four numbers named will be equal. For example, take

64	129	95	37	
65	34	58	27	
31	24	31	38	
7	7	7	7	Remarkable, isn't it?

Why not extend this idea and use numbers other than counting numbers! For example,

3 5/8	1/2	7 3/4	9 1/4
3 1/8	7 1/4	1 1/2	5 5/8
4 1/8	5 3/4	4 1/8	2 1/2
1 5/8	1 5/8	1 5/8	1 5/8

You may want to see if your students can discover some simpler way for cases like the one above. Can you?

MULTIPLICATION

Tables of various kinds provide ample and interesting practice, sometimes in more than one operation. Let me exhibit a few, for which I will invent names so as to have a means of referring to them.

There are regular tables like the ones which follow:

x	2	5	3	4
4				
1				
3				
5				

x	9	5	8	6	7
4					
8					
6					
9					
7					

The lower the grade level, the simpler and shorter one would make the table, of course. Incidentally, if you are a teacher of the intermediate grades or if you teach at the junior high level, did you ever have your students construct a table for the one hundred basic facts of multiplication? If you did not, it might be an excellent idea to do so. Then let the students see how many observations they can make by looking at the table carefully. I am certain you will be amazed at the many discoveries they can find.

Other than regular tables, a teacher might use what I call "puzzle" tables. These always hold more fascination for students. Examples of such are given below.

×			4
5			
3		9	
	8		16

×		9		
				20
	18	27		15
7			56	
8	48	72		

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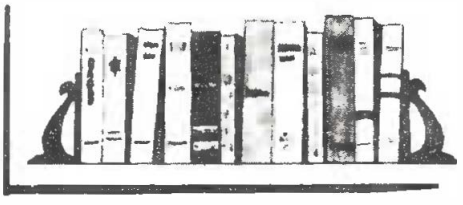
Book Reviews



MATHEMATICS A HUMAN ENDEAVOR - a textbook for those who think they don't like the subject, by Harold R. Jacobs. San Francisco: W. H. Freeman and Company, 1970.

The author has been motivated to write this intriguing textbook and teacher's guide because of the boring way in which New Mathematics is being taught. He has found that it is being taught like the Old Mathematics with too much "shoving of abstract symbols" and too much rigor to the extent that mathematics is uninteresting. Because of such unimaginative teaching, students never acquire an appreciation for the power and beauty of mathematics as it is