

WorkBook

Teaching Times Tables
a successful alternative

WorkNotes

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OBJECT

To teach multiplication (and addition) facts for immediate and discreet recall.

PROCESS

The success of this method is all about instilling belief that learning is natural result of effort/work and a concept of valuing improvement.

While it is often suggested in syllabuses that the easy tables (2×, 5× and 10×) should be learned first, this is fundamentally flawed. It relies on patterns rather than discreet knowledge. While patterns are important their use for learning times tables can be very detrimental to all but the more gifted learner.

An important aspect of the method outlined here is the use of the commutative property of multiplication to accelerate the learning of the multiplication facts. While the use of the expression 'Commutative Property' may have no real meaning to a young learner the fact that it has a name will impress upon the young learner that it is in fact an important concept.

METHOD

This method refers to WorkSheets with 100 questions. While it can easily be applied to WorkSheets of 50 questions for the younger first time learners, that is listed as a separate method.

It is assumed that the students have been made familiar with each of the times tables (in turn). So give the students the times tables listed in a vertical table to copy into their workbook, etc. The reading/writing process is an important step in most academic learning.

I suggest that the tables should be introduced one at a time. Additionally emphasise the importance of lining up the tables vertically. This should always be stressed when teaching any number concept as it can be critical in many areas such as when the algorithms are introduced.

$$\begin{array}{r} 2 \times 1 = 2 \\ 2 \times 2 = 4 \\ 2 \times 3 = 6 \\ 2 \times 4 = 8 \\ 2 \times 5 = 10 \\ 2 \times 6 = 12 \\ 2 \times 7 = 14 \\ 2 \times 8 = 16 \\ 2 \times 9 = 18 \\ 2 \times 10 = 20 \end{array}$$

While there are a lot of differing opinions I always put the multiplier first. This will have significance when the concept of the commutative property is applied.

When the tables are introduced the various words for expressing the tables should be used. Again this concept is very contentious. However my experience is that being aware of different ways of expressing a concept increases learning rather than hinders the learning. This also assists when a student's learning background differs from others. Examples for language when practicing the times table include;

$$\begin{array}{l} 2 \text{ times } 4 \text{ equals } 8 \\ 2 \text{ times } 4 \text{ is } 8 \\ 2 \text{ 4s are } 8 \end{array}$$

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Preparing the students.

The red parts should be spoken to the group.

- ☺ *We are going to start with the $2 \times$ tables. Even if you know them, our goal is to get faster. We could do the $1 \times$ tables, except they are a little too easy.* Children enjoy the humour.
We will be doing each of the times in turn, $2 \times$, $3 \times$, $4 \times$. etc. This will help us learn the tables quicker. Once you learn the $2 \times$ tables you already know one of each of the other times tables. When you then learn the $3 \times$ tables you will already know two of each of the other times tables. This uses the commutative law of multiplication. *Remember, 2×3 has the same result as 3×2 . They have to have the same answer or none of our mathematics would work. Similarly, 2×9 is the same as 9×2 , 4×9 is the same as 9×4 and so on.*
- ☺ *To learn the times tables in the quickest time possible, we will be using repetition.* Many misinformed educators believe that rote learning is bad. However, most learning results from repetition. In the context of learning number facts, repetition is highly appropriate. *When you do the Worksheets you will see the same question repeated many times. This helps to make sure that you memorise the tables.*
- ☺ The following is crucial for this learning process. *If there are any questions where the answer doesn't pop into you head immediately, then you have to learn that part of the times table better. So work out the answer using any method that works then repeat the individual table five times, example,*

$$2 \times 8 = 16$$

$$2 \times 8 = 16$$

$$2 \times 8 = 16$$

$$2 \times 8 = 16$$

$$2 \times 8 = 16$$

(Student repeats *two times eight is sixteen* 5 times)

The next time you see the question the answer should pop into your head. You will notice that the more you do the faster you get. That's because you are learning.

- ☺ *Because you are learning it is important to get more answers correct in a faster time. You don't have to always get 100 questions correct to show that you are learning.*
- ☺ Some of this should be repeated at regular intervals throughout the process. More often and more detail earlier in the process.

Ready to start

- ☺ Hand out a printed Times Table Worksheet, face down.
- ☺ Remind students that they have exactly two minutes to answer as many questions as possible.

Remember, stop immediately as it is important for you to know if you are improving.

Start

- ☺ Time the students for exactly two minutes and then
Pens down
- ☺ Remind students to mark their solutions carefully as it is important to know if they are improving and *cheating only cheats yourself.*
- ☺ It is not necessary to place ticks next to correct answers, however, a cross next to incorrect answers is useful in identifying problems.
- ☺ Call the answers to the students.
- ☺ *Write the number of questions you got correct out of the number of questions you attempted.* Example. $\frac{58}{61}$ if the student attempted 61 questions in the two minutes and got 58 of them correct.

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☺ The following set of questions is crucial for encouraging students during the learning process.

Put up your hands if you got 100 out of 100. Remember, 98 or 99 is close enough.

Put up your hands if you got every question you attempted correct.

Put up your hands if you attempted more questions this time compared to last time.

Students should raise their hands in response to each situation that applies. This has significance for improving self esteem.

Each table should be repeated each lesson until the majority of the group is achieving 100% or you are convinced that the majority of or the whole group know the times table being learned.

REMEMBER

- ☺ Not all students, especially the younger students, can write fast enough to complete all the questions in the two minutes.
- ☺ Don't be tempted to give more time. If, in two minutes, a student answers 60 or 70 questions without errors, then they probably know the tables.
- ☺ When introducing the next set of tables you should remind the students of all the tables they already know from their previous learning. (As a result of the commutative law)
- ☺ This process gives faster learning as long as the students are given the positive reinforcement outlined above.
- ☺ Not all students will follow the instructions about reading problem questions 5 five times before proceeding. These students require intervention early as their learning will suffer.

Use WorkSheets of 50 questions for the younger first time learners. The timing and the method is the same.