

ABSTRACT:

Before the advent of conventional system of calculation, people in different parts of the world were using different systems of calculation. The most well known system of calculation developed by Greeks is called hexadecimal system. They had no difficulty in representing large numbers, but the absence of any place value for their symbols complicated their system. Even the Romans, who succeeded the Greeks as masters of the Mediterranean world, and who are known as a nation of conquerors, could not conquer the art of calculation. This was a chore left to an abacus worked by a slave. No real progress in the art of calculating or in science was made until help came from the East. India taught the world about numbers and place value system (Arabic numerals). After that calculation became easier and this developed into today's conventional system.

Like hexadecimal system conventional system too has its limitations. It provides us a method to calculate but not fast enough to "Crack" competitions. To crack competitions you require "Magical Methods of Vedic mathematics". Perhaps the most striking feature of the Magical Methods is its coherence. This unifying quality is very satisfying; it makes mathematics easy and enjoyable and encourages innovation. The simplicity of the Magical Methods means that answers can be obtained in one line. The system provides scope for mental calculations.

This project provides scope to understand the simplicity of Vedic mathematics techniques to develop computational skills.

INTRODUCTION:

Usually students complain that mathematics is a difficult subject and is very confusing. In fact it is not difficult, but the system, which is being used to teach mathematics, is making the subject abstract and difficult. In order to enable a child learn mathematics in an easy way, it is necessary to get him acquainted with alternative system like 'Vedic Mathematics'. Such a system not only creates interest in the subject but also provides for easy and quick calculations. Thus an attempt is made to introduce few of the techniques of Vedic mathematics to the children at middle school.

Statement of the problem:

Improving Computational Skills Using Vedic Mathematics.

Significance of the study:

Students use calculators or cell phones for the multiplication of two or more than two digit numbers. Usually they commit mistakes in these simple calculations and loose marks and finally develop a feeling that mathematics is tuff. Vedic mathematics sutras provides simple pattern for mental calculations. If the students learn and practice these sutras they develop interest in mathematics as mathematics governs the life.

Statement of the hypothesis:

1. Vedic mathematics helps a student to solve mathematical problems 10-15 times faster.
2. Vedic mathematics helps in intelligent guessing (the answer without actually solving the problem)
3. Vedic mathematics reduces burden (Need to learn tables up to nine only).

4. Vedic mathematics is a magical tool to reduce scratch work and finger counting and improve mental calculation. It increases concentration.

5. Vedic mathematics improves confidence. Being unique Vedic mathematics brings instant recognition to its practioner.

REVIEW OF THE RELATED LITERATURE:

Vedic Math Research

Researches are being undertaken in many areas, including the effects of learning Vedic math on children. A great deal of research is also being done on how to develop more powerful and easy applications of the Vedic *sutras* in geometry, calculus, and computing. The Vedic Mathematics Research Group published three new books in 1984, the year of the centenary of the birth of Sri Bharati Krishna Tirthaji.

When in 1988, Maharishi Mahesh Yogi brought to light the marvels of Vedic maths; Maharshi schools around the world incorporated it in their syllabi. At the school in Skelmersdale, Lancashire, UK, a full course called "The Cosmic Computer" was written and tested on 11 to 14 year old pupils, and later published in 1998. According to Mahesh Yogi, "The *sutras* of Vedic Mathematics are the software for the cosmic computer that runs this universe."

METHODOLOGY:

Subjects:

The study was confined to 10 students of 7th standard, studying in Maharshi high school of Hyderabad city. The subjects were classified into three categories namely above average, average, and below average by the observation of teacher trainee during internship and the teachers of Maharshi school. Taking the scores obtained by these pupils' in different achievement tests conducted by the school also supported the observation.

Instruments:

Pre-test was conducted using an achievement test to know the speed and accuracy of the students in computational skills. The same is enclosed in appendix.

Similarly post-test was conducted using an achievement test to know the speed and accuracy of the students after teaching "vertical cross-wise" technique of Vedic mathematics. The same is enclosed in appendix.

Design:

Pre-test and Post-test design was employed.

Procedure:

The pre-test was conducted on the multiplication of two-digit and three digit numbers using conventional method. Results were evaluated. During the process the teacher trainee explained vertical cross-wise sutra of Vedic mathematics to improve the mental calculations for multiplying the big numbers in a simple way. The trainee taught the new technique to the students daily for half an hour for a period of one-week. After teaching

the new techniques of Vedic mathematics the post-test was conducted on the same parameters of pre-test but the teacher trainee has given different questions to see if there was any improvement in the students after teaching new sutras of Vedic Mathematics.

RESULTS AND DISCUSSIONS:

Table-1: Shows the results of accuracy of the entire sample.

<u>Test</u>	Pre-test	Post-test
<u>Mean</u>	73	100

Findings:

From the above table it is seen that the mean of pre-test is 73.

And the mean of post-test is 100. There is a considerable positive change in the results of the students.

Table-2: Shows the results of speed of entire sample:

<u>Test</u>	Pre-test	Post-test
<u>Mean</u>	12.2 min	9.9 min

Findings:

The mean speed of the students in pre-test is 12.2 min and the mean speed of post-test is 9.9min. It indicates that there is an improvement in the speed of mathematical operations.

Table-3: Shows the Results of above average students:

Above average			
Accuracy		Speed	
Pre-test	Post-test	Pre-test	Post test
10	10	10min	3min
10	10	12min	5min

Findings:

The accuracy of above average students is same in both pre and post-tests. But there is a tremendous improvement in speed.

It was found that Vedic mathematics tools would be helpful to above average students in improving both speed and accuracy with little effort.

Table-4: Shows the Results of below average students:

Below average			
Accuracy		Speed	
Pre-test	Post-test	Pre-test	Post-test
3	10	15min	17min
4	10	17min	20min

Findings:

From the above table it can be interpreted that there is considerable change in the accuracy of below average students. But they took more time in post-test when compared to pre-test. This shows that more practise is required for below average students.

CONCLUSIONS

Due to above mentioned facts it can be concluded that Vertical cross-wise sutra of Vedic system could be practiced to improve the speed and accuracy of the students in doing calculations as it is the primary objective of the mathematics. It helps, to calculate 10-15 times faster, and increases concentration. Students can be motivated to learn mathematics interestingly if the Vedic system of mathematics will be included into our curriculum. To give the fruits of Vedic system to all the students it is necessary to conduct workshops for the teachers on Vedic system as it is still in growing stage.

There are obviously many advantages of using a flexible, refined and efficient mental system like Vedic math. Pupils can come out of the confinement of the 'only one correct' way, and make their own methods under the Vedic system. Thus, it can induce creativity in intelligent pupils, while helping slow-learners grasp the basic concepts of mathematics. A wider use of Vedic math can undoubtedly generate interest in a subject that is generally dreaded by children.

REFERENCES

Web sites

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<http://hinduism.about.com/od/vedicmaths>

<http://www.hinduism.co.za/vedic.htm>

<http://www.about-homework.com/vedic-mathematics-tutorials.htm>

<http://www.maharishi-european-sidhaland.org.uk/VedicMathematics.htm>

<http://krantikiran.tripod.com/math/id7.html>

<http://www1.ics.uci.edu/~rgupta/vedic.html>

<http://www.vedicmaths.org>

<http://mathforum.org/electronic.newsletter/mf.intnews6.36.html>

<http://www.redzip.com/index.php?Tpid=10201&ttid=100&st=vedic%20mathematics%20tutorials>

APPENDIX-1

Vedic mathematics techniques used in the process of action research.

Here's how to use VERTICALLY AND CROSSWISE

1) For multiplying numbers close to 100.

Ex: Suppose you want to multiply 88 by 98.

Not easy, you might think. But with VERTICALLY AND CROSSWISE you can give the answer immediately, using the same method as above.

Both 88 and 98 are close to 100.

88 is 12 below 100 and 98 is 2 below 100.

You can imagine the sum set out like this:

$$\begin{array}{r} 88 - 12 \\ \times 1 \\ \hline 98 - 2 \\ \hline \underline{86 \quad 24} \end{array}$$

As before the 86 comes from subtracting crosswise: $88 - 2 = 86$ (or $98 - 12 = 86$: you can subtract either way, you will always get the same answer).

And the 24 in the answer is just 12×2 : you multiply vertically.

So $88 \times 98 = \underline{8624}$

2) Multiplying numbers just over 100.

Ex: $103 \times 104 = \underline{10712}$

The answer is in two parts: 107 and 12, 107 is just $103 + 4$ (or $104 + 3$), and 12 is just 3×4 .

3) The easy way to add and subtract fractions.

Use VERTICALLY AND CROSSWISE to write the answer straight down!

$$\frac{2}{3} + \frac{1}{5} = \frac{10+3}{15} = \frac{13}{15}$$

Multiply crosswise and add to get the top of the answer:

$2 \times 5 = 10$ and $1 \times 3 = 3$. Then $10 + 3 = 13$.

The bottom of the fraction is just $3 \times 5 = 15$.

You multiply the bottom number together.

4) Quick way to square numbers that end in 5

Using the formula BY ONE MORE THAN THE ONE BEFORE.

Ex: $75^2 = \underline{5625}$

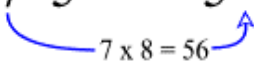
75^2 means 75×75 .

The answer is in two parts: 56 and 25.

The last part is always 25.

The first part is the first number, 7, multiplied by the number "one more", which is 8:

so $7 \times 8 = 56$

$$75^2 = 56 \quad 25$$


APPENDIX-2

PRETEST

Subject: Mathematics
Max.Marks: 10

Class: VII
Time: 15min

Answer all the following

$$72 \times 64 = ?$$

$$85 \times 25 = ?$$

$$88 \times 98 = ?$$

$$103 \times 104 = ?$$

$$\frac{2}{3} + \frac{1}{5} = ?$$

$$21 \times 31 = ?$$

$$75 \times 75 = ?$$

$$36 \times 41 = ?$$

$$25 \times 25 = ?$$

$$61 \times 31 = ?$$

Appendix-3

POSTEST

Subject: Mathematics
Max.Marks: 10

Class: VII
Time: 15min

Answer all the following

$$95 \times 95 = ?$$

$$55 \times 55 = ?$$

$$104 \times 107 = ?$$

$$103 \times 106 = ?$$

$$86 \times 96 = ?$$

$$97 \times 88 = ?$$

$$82 \times 98 = ?$$

$$84 \times 96 = ?$$

$$\frac{2}{3} + \frac{1}{5} = ?$$

$$\frac{1}{2} + \frac{5}{3} = ?$$