

Put  
MATHS BACK ON TRACK

Save  
the **Children**  
&  
**MATHEMATICS!**

**TEXT BOOKS**

A Genuine  
*REFORM*

Much Needed  
and  
**Long** Overdue

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*for Excellence in Mathematics*

## TEACH MATHS (1) - LAY THE FOUNDATION

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### TEACH MATHEMATICS

The NATURAL MATHEMATICS mentioned so far is better called *गणितम्*. It is life-mathematics and it is also *lively mathematics*. Both the teacher and the student will enjoy teaching this. A sound Ganitha lays a solid **foundation for life and higher mathematics**. It trains children **to understand, to analyse, to think logically** and to **face any 'problem' in life with courage and confidence**.

*How do you think the present day practice of students copying formulae and solutions and then mugging-up everything, including the answers will achieve this lofty goal?*

#### AIM

##### Help; Don't Hinder.

Our aim is to help children to **realise their full in-born potential** by helping them to observe and study the *patterns and behaviours of numbers* in different situations; and to be able to *use these* in future, for optimum results.

#### THE GURU IS SUPREME

Our Indian tradition has placed Deivam behind the Guru. The teacher is to strive to step into the shoes of the **traditional Indian guru**. He is the second parent; after Madha and Pitha. The guru is a fiercely independent, creative, innovative and productive artist. Each teacher will differ as much as each student will also differ, but the goal is the same.

#### TEXTBOOKS & FREEDOM

A committed teacher (unless a fresher) may not need a textbook. Today's textbooks (Government and Private) are a hindrance or liability (தொண்டுக் கட்சை) to teach any mathematics. [If you get access to a **30 to 40 years old textbook**, it may be a good support.] The school and the teachers have almost total freedom to teach mathematics; the only targets being set by the X or +2 Board examinations.

#### MATHEMATICS DEPARTMENT

Good aspiring schools that have *staff loyalty and continuity* can have a hierarchical Mathematics Department. The H.O.D. should be able to discuss, suggest and ensure that each level (Primary, Middle, Secondary) prepares the children with the appropriate skills needed by the next level.

#### SPECIAL EXTRA CLASSES

If real reform in teaching mathematics is possible, one would not need extra classes. After a couple of years of teaching mathematics, complaining about portions not finished, time not enough, etc. is only a *thamasha*. The same interruptions recur every year in different forms!

### TEACH MATHEMATICS ...

- FOUNDATION:** Manipulation of numbers is the foundation.
- 1) **Counting:** Counting numbers is the basis of all mathematical activity
  - 2) **Addition:** Counting by lumps.
  - 3) **Multiplication:** Counting by *same-sized* lumps.
  - 4) **Subtraction:** Counting by lumps *downwards*.
  - 5) **Division:** Counting *the number of same-sized* lumps.

Mastery of these skills is **the minimum essential pre-requisite** for any mathematics. Without this (foundation) it is like driving a car without wheels or with crooked wheels. And many countries, **India not excepted**, all over the world, today, have tried to do exactly that and landed themselves in soup. Unfortunately a *drunken* person does not realise he is drunk; he needs *external* help. Few, like New South Wales of Australia, have recovered and reverted back to traditional methods and others, including our own beloved India, are still in deep 'duped' state.

#### A SOLID FOUNDATION

At this foundation stage there is absolutely no room for any compromises at all. *Accuracy, Speed* and *100% Success Rate* are essential

*Accuracy:* **FIRST answer** (the RIGHT answer)

*Speed:* **INSTANT** (as if the child's name was asked)

For larger numbers, response to be in 5 (at most 10) seconds

*Success Rate:* **100%** (Nothing less would do)

While cycling, how many times are you 'allowed' to hit a person, a post or a dog? In a rocket launch, how many errors by ISRO are permissible?

#### LAYING THIS FOUNDATION

Any amount of time spent on laying this foundation is time well-spent.

Until these 5 skills are taught thoroughly, **no other mathematics need be taught**.

With these skills, children will pick up everything else very much faster.

#### <SAVE> THESE DATA-BASE TO MEMORY

Simply **<save>** the data-base of (1) Counting, (2) Addition Tables, (3) Subtraction Tables, (4) **Traditional** Multiplication Tables and (5) **Traditional** Division Methods to the **memory**. This is how our *Sacred Vedas* are preserved in thousands of families, down the generations, even today. **Daily drilling of repeated recital is the only proven, time tested, Indian traditional way.**

*This drilling also exercises the brain and enhances the memory.*

## TEACH MATHS (1) - LAY THE FOUNDATION

### RECITE & WRITE

To this we shall add reciting and writing also. We are all aware of an interesting '*learning fact*'. To clear a spelling doubt, we write the word on a piece of paper and almost always get the correct spelling. So there is some '*learning or memory*' in the '*writing*'. This we use for our benefit. So make children to recite and write in which process the *mouth, ears, hand* and *eyes* are involved. What better way? [A word of caution. Children have a tendency to write like a cross-word puzzle, vertically down which is 100% useless. That is why they MUST RECITE AND WRITE EACH LINE and then go to the next line below.]

### FOUNDATION - RESOURCE MATERIAL

A little **traditional** Booklet of Tables, popularly known as வாய்ப்பாடு, costing between Rs.5 & Rs.12, available in any bookshop (including the pavement shops) is the best resource material. Sometimes it is also known as 'எண் சுவடி'. It is a storehouse of 'information' in its own sense.

In these booklets one would find:

- Counting **from 1 to 100** and then **from 100 to 1** counting **1 by 1**, counting **2 by 2**, .... .., counting by **9 by 9**.
- Tables: 1) **Addition** Tables ☺  
2) **Subtraction** Tables ☺  
3) **Multiplication** Tables ☺
- புதுமுறை (New Method) Multiplication Tables ☹  
[This last item is a menace]  
**Why, when** and **how** did this multiplication tables creep into our school system???

The sooner this is removed WITHOUT ANY TRACE, the better for Mathematics and Children.

### MULTIPLICATION (4 TABLE)

Let us consider the 4<sup>th</sup> Multiplication Table. Here we count in *lumps of 4*.

#### The Table

One lump of 4 is	4
Two lumps of 4 is	8
Three lumps of 4 is	12
Four lumps of 4 is	16
Five lumps of 4 is	20
Six lumps of 4 is	24
Seven lumps of 4 is	24
Eight lumps of 4 is	24

#### The Symbol Form of The Table

1 x 4 =	4
2 x 4 =	8
3 x 4 =	12
4 x 4 =	16
5 x 4 =	20
6 x 4 =	24
7 x 4 =	28
8 x 4 =	32

and so on. Here we count **lumps of 4**.

The புதுமுறை பெருக்கல் வாய்ப்பாடு is twisted as below:

[Is this counting in lumps of 4?]

4 x 1 =	4
4 x 2 =	8
4 x 3 =	12
4 x 4 =	16
4 x 5 =	20
4 x 6 =	24
4 x 7 =	28
4 x 8 =	32

4 <u>lumps of 1</u> is	4
4 <u>lumps of 2</u> is	8
4 <u>lumps of 3</u> is	12
4 <u>lumps of 4</u> is	16
4 <u>lumps of 5</u> is	20
4 <u>lumps of 6</u> is	24
4 <u>lumps of 7</u> is	28
4 <u>lumps of 8</u> is	32

a n d

so on. Counting **lumps of what?**

**In addition see the confusion it creates 'in division'.**

Question: How many 4's in 32?

[This is basic division.]

- ☺ Eight 4's is 32 and so there are 8 fours in 32. [By Traditional table]
- ☹ Four 8's is 32 and so there are 8 fours in 32 [By the Modern Table]

### AT LEAST 10 LINES, 10 TABLES

We have other simple techniques for calculations like my DossQuickMathematics. So *at least* 10 or 12 lines of each table (if not the full 20) must be taught. Split each table into parts (5 or 6 lines each) and concentrate in one part at a time. Children who are willing to take up the challenge, may be encouraged to learn the full tables.