According to
Dr. B.S. Sudhindra....

U CAN DO

Mental
Ability
To
Hack
Equations in
Multiplication

MATHEMATICS

Volume I

A Primer on...

Addition
Their
Inverses
Correctly &
Sequentially

BASIS:

- Everyone has the required LOGIC SOFTWARE in-built at birth!
- Use ***FOLK-CAP*** procedure to solve maths problem

Useful to parents/ untrained teachers to help students to solve at their class level problems

... Making Maths digestible to billions using FOLK CAP Way

ARE YOU READY?

Cultivate the Joy of
Solving Math Problems!

HOW TO SUCCEED IN MATHS?

follow

"FOLK-CAP"

procedure to solve problems

Figure **O**ut the
Logic with **K**nowledge
of
Current **A**nd **P**revious
years/chapters

U CAN DO
MATHEMATICS

*..... making Mathematics Digestible to Billions using **FOLK-CAP Way***

Volume I

A Primer on...

- Will be useful to students of classes 5, 6, 7, 8, 9 and 10 in solving their standard level problems (total 6 years).
- This work is NOT a replacement for your class Textbook.
- Can also be read by Parents, untrained Teachers to help the Students better.
- **FOLK-CAP** Way inspire you to solve confidently challenging problems involving maths usually given in any competitive exams or you face in your life time.
- All phobias OUT, confidence IN

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U CAN DO MATHEMATICS

*..... making Mathematics Digestible to Billions using **FOLK-CAP Way***
by Dr. B.S. Sudhindra

Vol. I
A Primer on...

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THIS BOOK IS
DEDICATED TO

CHAMPAKA M.A. (Economics)

my wife for her immense sacrifice
(of leaving her job) and looking
after me [42 ++ years] and two sons
– a true house wife.*

Mathematically writing, she deserves
70% of any credit that I get for this work.

*After seeing my work, with so many expansion for commonly used words in education, an expert visiting my centre at IGNOU, RC, Bangalore, in early 2010 posed the question, what is your acronym for wife ? My reply, by next day, was (in management jargon) ..... **"Willingfully Involved in Family Enterprise!"**

ABOUT THIS WORK

Origin: I joined IGNOU as a First Batch Regional Director in June, 1989. At headquarters, based on my experience in Molecular Medicine, I worked towards establishing the School of Health Sciences at IGNOU. I was transferred to Pune to head IGNOU centre for Maharashtra in April, 93. We used to have frequent RDs meeting at Delhi. In one such meeting in late 1993 or early '94 we had interaction with Joint Secretary, MHRD. After knowing my Academic and Research background, he shared the problem the Government is facing in the field of School Education. "Government of India annually looses crores of rupees due to failures in 8th, 10th and 12th standards across the country - mainly in the subject of English and Maths. ..... Can you help us in solving this problem?" I said yes, I will study the problem after reaching Pune. *.....so began the journey for finding a solution to Maths problem solving!*

a) During my brief stay at Oxford ('82-83) I became aware of Ladybird Series Books on learning English language. I could see the reason why English has became so popular across the globe.

b) So I thought let me devote time to solving the maths problem. By mid 1995, I created a simple solution with acronym NEED IPS way to write a complete answer to any question and this was distributed to students in Maharashtra. as part of a Memorobillia-1995 booklet to students. A maths faculty collegue wrote back to me saying that this method is not applicable to maths. [Interestingly never wrote what is applicable to maths!]. Fortunately, this gave me further opportunity to think of what is applicable to Maths.

After having used Maths for variety of situations in quantum chemistry problems and molecular modelling for drug design, which all involves extensive computer programming as well. I wondered how to simplify maths problem solving sequence to the beginners .... school students ? *Luckily I could devise a simple way with the acronym* **FOLK-CAP**.

With the expansion Figure Out the Logic with Knowledge of Current And Previous years in Maths. The work was shared to IGNOU Maharashtra Students in Memorobillia-1996. Several articles highlighting the features have appeared in the Newspapers like HINDU (2001), Deccan Herald (2003), Times of india (2006), Indian Express (2007). Recently I did share all these details with DSCRT, Karnataka Govt. and KTBS in May, 2018. There has been inumerable obvious requests where is your book?

Due to numerous official commitments (public interest) as RD and D(RSD), OSD etc. I had no time to think to write a book. Again, after retirement other family commitments took my time. Now, Thank God, it is now ready to present to the public.

The write-up is different in Form than normal books. The target audience for this book is whole population of India! That is all, I can do and enjoy Maths. 21st century demands a Maths Literate Society!

So, the writing is not cramped with information and the basics are presented as a PRIMER maths problem solving.

Future volumes will be applications in many areas of STEAM (Science, Technology, Engineering, Arts and Mathematics) and Liberal Art Students.

I hope the material is readable and digestible to you all.

I welcome criticisms openly.
Please do share your views at drbssudhindra@gmail.com

Best Wishes

19th July, 2019.
Bengaluru-560 011.

Dr. B.S. Sudhindra

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PART-1:
DUTIES OF A STUDENT

Frame #1

On importance of Maths.....

Dr. B.S. Sudhindra's view

INDIA : A BILLION MINDS !
WHAT DO THEY NEED ? R + K + M

- R [roti] + K [kapada] + M [makhaan]
- 1,30,00,00,000 minds = 1.3×10^9
  [1bn = 100 Crores = 1000 million]
- To achieve better R - K - M, they need to do more :
  R [Read] + **K** [Knowledge/Education]
  + **M** [Mathematics]
- So we need a MATHS Literate Society !

Maths Literacy enhances One's analytical ability to solve problems in Life !

BSS for DD Chandana, 25/11/2016

Minds = Population

On importance of Maths.....

Frame #2

INDIA HAS A RICH CONTRIBUTION TO MATHS!

- India is the ONLY country which has the following national slogan : "**Satyameva Jayate**"
- India's contribution to the growth of Mathematics is immense. Dates back to 3000 to 5000 BC [w.r.t. 2016]
- The digit '0' named as Zero, and 0, 1, 2, 3, 4 5, 6, 7, 8, 9 and decimal system is an INDIAN contribution to the Maths world!
- So, let us be proud and let's become a Maths Literate Society in 21st century.
- [See around.... People coming from outside Karnataka find Kannada difficult to speak/ write, likewise those who move out of Karnataka find other region's regional language difficult, so is the world - reality in life!]
- Successful people are those who can, 'manage to live' in any surrounding - language media.
- So GET FAMILIAR WITH MATHS
  you will lead a 'confident' life.

BSS for DD Chandana, 25/11/2016

MATHS IS ALSO A 'LANGUAGE'
MATHS IS 'TRUTH'

On importance of Maths.....

Frame #3

MATHS IS ALSO A 'LANGUAGE'

- Like any language it has list of
  - ~ words,
  - ~ symbols and
  - ~ way of putting it - Grammar, Logic

  we have to get FAMILIAR with them! That's all.
- No need to get tensed about it.

You need to know - **GET FAMILIAR** - with only about **650 sight Words and Sight Phrases** in Maths upto 10 standard level!
[Over a span of 10 years of schooling!]

Remember:

1. Maths is NOT a spectator activity.
2. You ENJOY maths only ***BY DOING*** it.

BSS, 1996

On importance of Maths.....

Frame #4

MATHEMATICS IS A PRECISE LANGUAGE!
EXTENSIVELY USED TO:
DESCRIBE, UNDERSTAND AND
PREDICT THE EVENTS IN OUR
PHYSICAL WORLD ....
DAILY LIFE.

Maths is also called
'Queen' of Sciences !
.... and 'King' of Arts!
.... yet NOT seen in
School Annual shows?

Your duty/work: GET USED to 'Sight Words and Phrases' of YOUR class level.

B.S. Sudhindra, 1996

On importance of Maths.....

Frame *#5*

DO NOT CHEAT YOURSELF !

- Devote 'Quality Time' everyday to studies!
- DO NOT waste time watching LONG hours.
  - ~ TV or
  - ~ on Mobile or
  - ~ on Internet
  - ~ get-together parties
- Do your DUTY of a student FIRST.

BEST TIME TO DO MATHS ?

- How a Student spends 4 AM to 7 AM everyday defines the outcome!
  - Success / confident / Happy Life !
- Start Studying Maths very early in the morning FIRST.

B.S. Sudhindra, 1995-2002, BSS-3; 24/10/2002

Misconception 1 ..... No Maths !

Frame #6

IN A CLASS, AMONG THE STUDENTS THERE IS AN ARTIST, WHO DOESN'T NEED TO KNOW ABOUT MATHEMATICS ..... A MISCONCEPTION

- An Artist draws (geometry in action!) figures, paints [color combinations .... Set theory in action!] in right proportions [Arithmetics in action!]... **all done using IN-Built logics in brain by birth!** ... although with no formal training in maths terms!
- They use 'imagination' logical thinking ... and hand movements (paint / chisel) ... which other students learn in 'drawing classes' or SUPW activity!
- When they get a formal Maths details will make them 'whole' **Architect!**
- In India, Everyday morning and during festivals time ladies draw colorful rangoli.... Maths.
- Geometry and Set theory in action... all done 'intuitively' without formal Maths! ..... as logic software inbuilt is being used more frequently as 'passion'.
- Get to know Fuzzy logic ..... Fractal geometry... Practice makes one perfect ..(saying) ... so also.
- 'Young to be Artist' spends lots of time to this activity! so Sparing time to Maths is a MUST.

BSS-11, 19/01/2017 9.57 pm

Are You Aware how to Study ?

Frame #7

DUTIES OF A STUDENT !

To Learn and Practice the 5R-L Elements in Education

L: **LISTENING SKILLS**
Recognising Words During Lecture/TV programme

1 R: **READING SKILLS**
Follow SQ3R steps (F.P. Robinson, 1970) for Reading / Understanding a Text/topic.

2 R: **WRITING SKILLS**
Follow NEED-IPS steps (B.S. Sudhindra, 1995) for writing a complete answer.

3 R: **PROBLEM SOLVING SKILLS**
Follow FOLK-CAP steps (B.S. Sudhindra, 1996) for success in maths.

4 R: **COMPUTER USAGE SKILLS**

1. FIRST Choice : Use of Free and Open Source Software [FOSS] like Ubuntu, Office Libre, Scilab, R, Python etc. In the initial stages, usage may look a bit tough. But once practiced you will have a host of free softwares at no cost to enhance your skills in any area. You will be working in a virus attack free environment.
2. Proprietary softwares like Win10, MS Office 2016. [Home and Student Edition] But costs for every new tools.
3. However, one can have both the versions working on the same computer via. suitable partitioning.

5 R: **PRESENTATION SKILLS**
Verbal and body movements in a talk / interview / discussion / work place.

PRACTICE THESE SKILLS DURING YOUR 12 YEARS OF SCHOOLING PERIOD TO EXPERIENCE THE JOY OF SUCCESS.

B.S.Sudhindra, 1996, updated 3/12/2017

On importance of Maths.....

Frame #8

MATHS SIGHT WORDS AND PHRASES

- These are words and phrases that are commonly used in Maths.
- Every learner must get used to
  - ~ seeing
  - ~ recognizing
  - ~ understanding its meaning
  - ~ applying to solve problems
- While in the English language we have a list of first 100, 300, 500, 1000 and 2000 words are well known, a similar exercise in Maths area is not easily available.
- **This work provides** a list of all relevant sight words and phrases useful to students from 5th to Jr. College level.

BSS-2, 24-10-2002

PART-2:
AH! FOLK-CAP WAY

Summary

- As a nation, we require all to become maths literate! The line of action presented here is targeted at making maths becoming digestible to millions, at least up to the secondary school level.
- A general solution to the problem of failures in mathematics subject at HSC/SSC level is outlined. The prescription involves first an understanding the meaning of Sight words and phrases relevant to classes 5 to 10. A list of 7 tables consisting of math's Sight words and Phrases used in classes 5 to 10 are given so as to facilitate learners to check their preparedness.
- In the second stage, a simple 5-step **FOLK-CAP** [**Figure Out the Logic of Knowledge of Current** (class) **And Previous** (classes/years)] procedure is detailed to solve problems.
- The whole approach is based on the premise that every human being possesses a powerful logic software embedded in the brain and one need only to use them.
- Tips for developing a facilitating (learner's friendly) maths text book and a new general format (self instructional/contained) for problem solving are documented.

2.1. Introduction

Strange situations are a way of life. Our nation has made rich contributions in the area of mathematics. Names like Aryabhatta, Leelavati, Ramanujam, immediately comes to mind. Of late, we hear about winning in Maths Olympiads as well. However, when one looks at the results, especially the pass percentile of students in SSC & HSC at State level board exams, math's appears to adorn the role of a villain![1,2]

As a nation we do have centers of excellence in reputed institutes like TIFR-Mumbai, Mathematical Institute at Chennai, The Statistical Institute at Kolkotta, faculties at IITs, IISc, Bhaskaracharya Pratistan at Pune, etc. Besides we do have associations of mathematicians at national and local chapter level too.

In spite of this tremendous manpower, appreciation for the subject is still at a low level. Why so? OR How can we make the so called 'dreaded subject' into a lovable one at 'entry level' in the life of students? Their future with respect to becoming a university level educated group, is at stake. No doubt NCERT, NOS (now NIOS) and State Education Boards have their valuable books in the area.

Efforts in the west in this direction include the famous University of Chicago School Mathematics Programme[3] UCSMP series and the rule of three (GNA) description to introduce calculus.[4]

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*
This is is an original article submitted to Journal of Distance Education (University of Jammu) in November, 2002, from IGNOU Regional Centre for Maharashtra at Pune (IG/MRC/2002/11526 dated 29.11.2002). As the length of the article was too long a shorter version appeared, [Vol X, No. 1, 2003, pp 152-160] which is available through CEMCA .....on google. An updated version is given here.

2.2. An alternate Strategy

A de-tour to all the above efforts, a prescription utilizing the logic power embedded in every human brain and a simple procedure which can be used all through the academic years (Std.5 to 10) is described below. It involves a two stage process, one getting familiar with maths sight words and phrases relevant to their class level and in the second stage utilizing the knowledge learnt in the **Current And Previous** (CAP) classes to solve problem in a step process termed **FOLK-CAP**.

2.2.1. Maths Sight Words

Our objective is to **FACILITATE EVERY STUDENT** (in the language of distance learning system, students are referred as learners) to experience success. Why they find topics other than maths easy and or interesting? When we look at prescribed books of other subjects and maths, one notes a significant factor - that strikes all immediately, namely the vocabulary and language of maths versus the English language and its vocabulary.

In the English language, there exists literature, which has analyzed most important or commonly used words. List like first 100 words[5], first 300 words and even first 2000 words[6] that a student at the SSC level need to be familiar with are available.

However, when it comes to finding a similar list for Maths words /terms for students up to SSC level, there appears to be none!. There is however, no dearth of dictionaries. Dictionaries play different role and they are not classified in terms of std. 5 to 10 level stage wise.

An analysis of maths words used in typical Std. 5 to Std. 10 textbooks was undertaken by this author and the results are described in the table:

Upto 4th Std. Only = Beginning of 5th Std.

Standard-in	Number of words at the beginning	New words learnt in this class	Total number of Sight Words (CAP)
5th Std.	112	61	173
6th Std.	173	87	260
7th Std.	260	78	338
8th Std.	338	66	404
9th Std.	404	103	507
10th Std.	507	133	640

(see Tables 1 to 7 for a word /phrase list)

Quite interestingly we note that **only about 650 Maths words a student need to understand, use them effectively in problem solving!**

Certainly the word list is not too long!

Teachers need to emphasize in classes and parents need to facilitate their wards to master them. Such a combined effort automatically takes care of the attention factor that this subject demands.

Further one can broadly classify these words into arithmetic, algebra, geometry, trigonometry and statistics related words. Then we see much lesser number of words in each category. Every student must get used to seeing, recognizing, understanding its meaning and use it while solving problems.

2.2.2. FOLK-CAP for Success in Maths

The phrase **'Problem Solving'** is used in many spheres of specialities, like management, physics, Engineering, and pure mathematics. Different lines of action are suggested[7- 13]. However, the line of action suggested here is targeted at making maths becoming digestible to millions, at least up to the secondary school level ! As a nation, we require all to become maths literate!

Based on this author's experience in application of maths to diversified areas as quantum chemistry[14], molecular modeling in drug design [15] and writing computer programs able to run on various platforms, a simple approach to cultivate the Joy of Solving Maths Problems was developed and is described below:

This is labeled as **'FOLK-CAP'** procedure. The acronym stands for **'Figure Out the Logic with Knowledge of Current And Previous'**.

The basic tenet of the whole approach is the emphasis on logic, which fortunately, Every human being has 'in-built' logic software! One has to be proud/confident of it and make extensive USE of it. As one grows up, he/she only needs to enlarge that database – cases or situations!

Eg. A child's cry for food or attention, ability to mimic etc.

Acquired Logic includes rules of multiplication, division rules of addition, subtraction, w.r.t sequence of operation of these {last [second(-first....) ..]} left to right within a sequence etc.

(BODMAS is also an acronym which is seen in many text books)

MATHS SIGHT WORDS AND PHRASES

TABLE -1

Begining of 5th Class (CAP - 4)

_____	acute angle	_____	_____	_____
_____	addition	_____	_____	_____
_____	angle	_____	_____	_____
_____	arc	_____	_____	_____
_____	average	_____	_____	_____
_____	base	_____	_____	_____
_____	bills	_____	_____	_____
_____	borrowed	_____	_____	_____
_____	breadth	_____	_____	_____
_____	capacity	_____	_____	_____
_____	cash receipt	_____	_____	_____
_____	chord	_____	_____	_____
_____	circle	_____	_____	_____
_____	closed figure	_____	_____	_____
_____	cm	_____	_____	_____
_____	common denominator	_____		_____

MATHS SIGHT WORDS AND PHRASES

common factors

common multiple

compass

composite number

construction

convert

cost price

credit bill

cross multiplication

days

decimal

diagonal

digit

distance

distance = length

distributive property **x** w.r.t **+**

dividend

equality

MATHS SIGHT WORDS AND PHRASES

equation

equivalent

equivalent fraction

even number

factor

find

fraction

hundred

hypotenuse

interest

leap year

least common multiple

left to right

length

less than

LHS

line

litre

MATHS SIGHT WORDS AND PHRASES

_____	loss	_____	_____	_____
_____	m	_____	_____	_____
_____	magic square	_____	_____	_____
_____	mathematical expression	_____		_____
_____	minutes	_____	_____	_____
_____	mixed numbers	_____	_____	_____
_____	mm = millimeter	_____	_____	_____
_____	more	_____	_____	_____
_____	numeral (s)	_____	_____	_____
_____	numerator	_____	_____	_____
_____	odd number	_____	_____	_____
_____	one-fourth	_____	_____	_____
_____	one-third	_____	_____	_____
_____	opposite sides	_____	_____	_____
_____	order of operation	_____		_____
_____	parallel line	_____	_____	_____
_____	parallelogram	_____	_____	_____
_____	per hour	_____	_____	_____

MATHS SIGHT WORDS AND PHRASES

period

perpendicular lines

prime numbers

principal

profit

protractor for angles

quarter

quotient

radii

radius

Ramanujam

rate of interest

receipts

reciprocal

recognizing

rectangle

recurring decimal fraction

reduce form

MATHS SIGHT WORDS AND PHRASES

remaining

roman numerals

seconds

segment

selling price

sequence of operation

sides

simple interest

simple interest

smaller

speed

square

subtraction

test by 3 and 9

test of divisibility by

test of divisibility by 2

test of divisibility by 5

triangle

MATHS SIGHT WORDS AND PHRASES

_____	unit place	_____	_____	_____
_____	vertex	_____	_____	_____
_____	verticies	_____	_____	_____
_____	volume	_____	_____	_____
_____	vulgar fraction	_____	_____	_____
_____	weight	_____	_____	_____
_____	year	_____	_____	_____

Total 112 words only

EXERCISE:

These tables have open spaces left for:

- ☞ For students to write the same word for practice purpose. (something like a workbook).
- ☞ Parents and teachers please **ensure** the student uses these blank spaces as work book.
- ☞ For translating these words in the medium of instructions employed in their school/state. In India officially we have 22 regional languages. TEACHERS CAN TRANSLATE THESE WORDS INTO THEIR TEACHING MEDIUM.

MATHS SIGHT WORDS AND PHRASES

TABLE - 2: Class - 5

CAP - 5 = Current (This Table) + Previous (CAP-4)

1 is not a prime number

centre

decimal fraction

denominator

descending

determine

devisor

diameter

draw a line, an angle

hours

improper fraction

in all how many = sum

integer

intersecting

investment

kg

MATHS SIGHT WORDS AND PHRASES

km

lakh

LCM

line segment

loan

measure

millilitres

month

multiplicative inverse

multiply divide

non intersecting lines

numbers

obtuse angle

part of a whole

per minute

per second

percentage

perimeter

MATHS SIGHT WORDS AND PHRASES

place value

point

point of intersection

prime factors

proper fraction

quadrilateral

remainder

RHS

right angle

set square

side of an inequality

sold

solve

solving an equation

sum

sum = total

ten's place

test of divisibility by 5

MATHS SIGHT WORDS AND PHRASES

_____	thousand	_____	_____	_____
_____	three-fourth	_____	_____	_____
_____	together	_____	_____	_____
_____	total	_____	_____	_____
_____	two sides	_____	_____	_____
_____	unitary method	_____		_____
_____	verbal statement	_____		_____
_____	week	_____	_____	_____
_____	withdrawn	_____	_____	_____

CAP - 5

Total 173 words only

CAP - 5 = Current (This Table) + Previous (CAP-4)
61 + 112 = 173 words

EXERCISE:

- ☞ MAKE YOUR OWN DICTIONARY at your class level V. Using these words and meaning given in your text book.
- ☞ Students of Class V can skip tables 3 to 7 of higher classes and continue read from page 58.

MATHS SIGHT WORDS AND PHRASES

TABLE - 3: Class - 6

CAP - 6 = Current (This Table) + Previous (CAP - 5)

adjacent angle

algebraic expression

alternate angle

amount

area

area of surface of cube

area of surface of parallelpiped

ascending order

bar chart

binomial

bisecting angle

centre of circle

coefficient

collinear points

complementary angle

components of triangle

MATHS SIGHT WORDS AND PHRASES

concurrent lines

congruent angle

congruent line segments

constructing a perpendicular

construction an angle

co-prime number

corresponding angle

CP

directed number

direct variation

divisors

edges

equilateral triangle

equivalent ratios

Euclid

expression

exterior portion of an angle

faces

MATHS SIGHT WORDS AND PHRASES

GCD

gm

greater than

greatest common divisor

group of points

half

HCF

Highest common factor

index number

indicies

interior angle

interior portion of an angle

intersection of planes

intersection of straight line

inverse variation

length of segment

linear pair of angle

lowest common multiple

MATHS SIGHT WORDS AND PHRASES

multiples of parts

negative integers

non-collinear points

number liner

opposite concept

origin

original concept

pairs of angles

parallel planes

per annum

per day

per year

plane

polynomial

power

propotion

ratio

ray

MATHS SIGHT WORDS AND PHRASES

rectangular parallelpiped

scalene triangle

segment of a circle

SP

straight line

subtraction of algebraic exp

supplimentary angle

term

test of divisibility by 11

test of divisibility by 12

test of divisibility by 4

transversal

trinomial

use of compass

use of protractor

verically opposite angle

whole number

MATHS SIGHT WORDS AND PHRASES

CAP - 6

Total 260 words only

Current (This Table) + Previous (CAP-5)
87 + 173 = 260 words

EXERCISE:

- ☞ MAKE YOUR OWN DICTIONARY at your class level VI. Using these words and meaning given in your text book.
- ☞ Students of Class VI can skip tables 4 to 7 of higher classes and continue read from page 58.

TABLE - 4: Class - 7

CAP - 7 = Current (This Table) + Previous (CAP - 6)

_____	adjacent sides	_____	_____	_____
_____	altitude	_____	_____	_____
_____	angle bisectors	_____	_____	_____
_____	area of a parallelogram	_____		_____
_____	area of a rhombus	_____		_____
_____	area of a trapezium	_____		_____
_____	area of a triangle	_____		_____

MATHS SIGHT WORDS AND PHRASES

_____	arrange/order _____ _____	_____
_____	ASA construction _____	_____
_____	bar graph _____ _____	_____
_____	bisectors _____	_____
_____	circum-circle of a triangle _____	_____
_____	commission _____ _____	_____
_____	concurrence in a triangle _____	_____
_____	congruence _____ _____	_____
_____	congruence of angles _____	_____
_____	congruence of line segments _____	_____
_____	congruence of rectangle _____	_____
_____	congruence of right-angled triangles _____	_____
_____	congruence of squares _____	_____
_____	congruence of triangles _____	_____
_____	congruent circles (equal radii) _____	_____
_____	constant term _____ _____	_____
_____	construction of all types of quadrilaterals _____	_____
_____	_____	_____

MATHS SIGHT WORDS AND PHRASES

convention / writing negatives

corresponding element of triangle

cyclic quadrilateral

discount

equality of/order relation

equation

equi-areals

equivalent rational numbers

exponent

factorising polynomials

folding technique (paper) to verify

identities

income tax

Inscribed angle

index

medians

mid-point

MATHS SIGHT WORDS AND PHRASES

monomial

natural numbers

negative rational numbers

numbers with negative index

one variable

opposite angles

orthocentre

period of interest/loan

perpendicular bisectors

point of concurrence

positive rational number

positive integers

pythagoras

pythgorean triplet

rational numbers

rebate

reduced form of rationals

rhombus

MATHS SIGHT WORDS AND PHRASES

rule for converting negative index to + index

rule for the index of the product of numbers

rule of index of a number in p/q form

rule of the index of the exponent

rule of the product of index numbers

rule of the quotient of index numbers

SAS construction

semicircle

square root

SSS contruction

supplementary

theorem

time

MATHS SIGHT WORDS AND PHRASES

trapezium

value

variable

variation

work

CAP - 7

Total 338 words only

Current (This Table) + Previous (CAP-6)
78 + 260 = 338 words

EXERCISE:

- MAKE YOUR OWN DICTIONARY at your class level VII. Using these words and meaning given in your text book.
- Students of Class VII can skip tables 5 to 7 of higher classes and continue read from page 58.

TABLE - 5: Class - 8

CAP - 8 = Current (This Table) + Previous (CAP - 7)

AAA test for similarity

angular measure of arc

area of a circle

Aryabhatt

MATHS SIGHT WORDS AND PHRASES

axis of symmetry

bank transactions

circumference

class

class interval

class mark

compund interest

cone

co-ordinate geometry

cubes and cube roots

cubic expression

current account

cylinder

depreciation/reduction

division of segments

first quadrant

first time coordinate geometry appears 8^{th}

MATHS SIGHT WORDS AND PHRASES

first time statistics appears in 8th

fixed deposit account

fourth-quadrant

frequency

growth/increase

half-yearly interest

heron formula

identities expansion

intercept

irrational numbers

irregular polygon

length of an arc

major arc

mean

mid-point of class

minor arc

passbook

MATHS SIGHT WORDS AND PHRASES

plotting a point

quadrants

quadratic equation

quadratic expression

quarterly interest

real numbers

reflection anglereflection line

reflection point

SAS test

savings account

secant

second quadrant

sector of a circle

similarity

simultaneous equation

sphere

SSS test for similarity

statistics

MATHS SIGHT WORDS AND PHRASES

sum or difference of two cubes

surface area

surveyor's method

symmetry

tangent

third quadrant

triangulation method

withdrawal/deposit

X-axis

Y-axis

CAP - 8

Total 404 words only

Current (This Table) + Previous (CAP-7)
66 + 338 = 404 words

EXERCISE:

☞ MAKE YOUR OWN DICTIONARY at your class level VIII. Using these words and meaning given in your text book.

☞ Students of Class VIII can skip tables 6 to 7 of higher classes and continue read from page 58.

MATHS SIGHT WORDS AND PHRASES

TABLE - 6: Class - 9

CAP - 9 = Current (This Table) + Previous (CAP - 8)

absolute value

altitudes of a triangle

angle addition property

angle construction property

angle measure axiom

antilogarithm

ASA test

associating one number with other

axiom of parallel lines

axioms = self evident truths

binomial quadratic surd

Cantor G

characteristic of a number >1

coefficient form of polynomial

MATHS SIGHT WORDS AND PHRASES

collection of objects

comparison of angles

complement of a set

complementary angle

condition for parallelism

congruent segment

constant polynomial

converse of linear pair axiom

converse theorem of isosceles triangle

convex sets

coplanar

degree of a polynomial

depreciation value

disjoint sets

domain of a function

domain of a variable

element

MATHS SIGHT WORDS AND PHRASES

empty set

equal sets finite sets

equality of polynomial

exterior of a triangle

finite sets

flat plane axiom

geometric inequalities

half-plane

HCF of polynomials

hypotenuse-side theorem

infinite sets

interior of a triangle

intersection of two sets

laws of indices

LCM of polynomials

length of a segment

linear equations in one unknown

linear pair axiom

MATHS SIGHT WORDS AND PHRASES

_____	listing method	_____	_____	_____
_____	loci	_____	_____	_____
_____	locus	_____	_____	_____
_____	logarithms	_____	_____	_____
_____	logical reasoning	_____	_____	_____
_____	mantissa of a number	_____		_____
_____	medians of triangle	_____		_____
_____	member	_____	_____	_____
_____	midpoint of a segment	_____		_____
_____	mixed surd	_____	_____	_____
_____	Napier J	_____	_____	_____
_____	non-coplanar	_____	_____	_____
_____	objects	_____	_____	_____
_____	operation on sets	_____		_____
_____	pi	_____	_____	_____
_____	plane separation axiom	_____		_____
_____	point plotting axiom	_____		_____
_____	population growth	_____		_____

MATHS SIGHT WORDS AND PHRASES

proof

pure surd

rational algebraic expression

rationalisation of surds

remainder theorem

roster method

rule form

rules for equivalent form

SAA test

set

set builder

side of a line

solution set

subsets

surds

synthetic division method

terminating type

theorem - alternate angle test

MATHS SIGHT WORDS AND PHRASES

theorem for converse of corresponding angle

theorem for corresponding angles test

theorem for remote interior angle

theorem of angle bisector

theorem of isosceles triangle

theorem of midpoints of 2 sides of triangle

theorem of perpendicular bisector

theorem-converse of alternate angle test

theorem-converse of interior angle test

theorem-interior angle test

theorem-sum of angles in a triangle = 180

theorem-sum of angles in quadl = 360

MATHS SIGHT WORDS AND PHRASES

union of two sets

universal set

value of a polynomial

venn diagram

word problems

zero polynomial

CAP - 9

Total 507 words only

Current (This Table) + Previous (CAP-8)
103 + 404 = 507 words

EXERCISE:

- MAKE YOUR OWN DICTIONARY at your class level IX. Using these words and meaning given in your text book.
- Students of Class IX can skip table 7 of higher class and continue read from page 58.

MATHS SIGHT WORDS AND PHRASES

TABLE - 7: Class - 10

CAP - 10 = Current (This Table) + Previous (CAP - 9)

abscissa = x-coordinate

account holder

annual income

areas of paths

at par, above par, below par

bank (banking)

bank account

basic proportionality theorem

brokerage, broker

capital

cartesian plane

cash discount on early payment

central angle

circular region

commision

compound proportion

MATHS SIGHT WORDS AND PHRASES

concydic points

congruency of circles and arcs

CONSTRUCTIONS 25 experiments MUST

converse of pythogoras theorem

co-ordinate plane

cos q

cosecant q

cotangent q

credit

debentures

debit

degree of constant = 0

degree of the equation

deposits money

depreciation and growth

division by 0 not defined

discount on marked price

MATHS SIGHT WORDS AND PHRASES

endowment assurance policy

exterior of a circle

factorisation by completing the square

factorisation by splitting the middle term

factorisation of difference of two squares

factorisation of perfect cubes

factorisation of perfect square trinomial

gain% # discount%

general insurance

gift tax

GIS group savings linked insurance policy

GPF

HCF x LCM of 2 polys = first poly x 2nd poly

MATHS SIGHT WORDS AND PHRASES

HCF of polynomials

hemisphere area/volume

HRA house rent allowence

inadequacy of rational numbers

indirect tax sales tax, entertinement tax, road tax

inequalities in a triangle

inscribed angle

instalments

insured, insurance amount

intercept theorem

interior of a circle

ir-reducible polynomial x**x + xy + y**2

ir-reducible polynomials x**2 + x + 1

irregular polygon

isosceles triangle theorems

MATHS SIGHT WORDS AND PHRASES

LCM of polynomials

lends money

life policy

loss percent

Measument of areas in triangles

measure of arc

measurement of areas in quadrilaterals

measurement of areas in quadrilaterals in circle, portions of

measurement of areas in quadrilaterals in solids surfaces

measurement of volumes in solids

mid-point theorem

NOS

n^{th} root of + real a = + real b then b**n = a

ordinate = y-coordinate

MATHS SIGHT WORDS AND PHRASES

overhead charges added to cp

partnership

premium = fixed amount paid regularly

product of the roots of quadratic eqn

profit percent

proportion

PRT = simple interest prepare expenses

quadratic eqn from given roots

radical of a number

ratio

rational expression = quotient of 2 polynomials

real numbers

MATHS SIGHT WORDS AND PHRASES

rebate on donations

recurring deposit cumulative account

repair expenses

RHS in congruency in right triangles

right circular cone

right circular cylinder areas/volumes

same segment angles =

secant

secant q

shares

shortest distance

simple proportion

sin q

special product (x + y) X (x2 – xy + y2)

special product (x + y) X (x – y)

MATHS SIGHT WORDS AND PHRASES

special product cubes of bionomials

special products $(x \pm y)^2$

standard deductions

statistics

sum of roots of quadratic eqn

sum or difference of two cubes

surcharge

surface area/volume of sphere

tan q

tangent

taxable income

taxation

term deposit

Thales theorem basic proportionality

theorems-isosceles triangles

third party insurance

MATHS SIGHT WORDS AND PHRASES

time and distance

time, work and wage

transactions (dealings)

transportation charges added to cp

trignometric applications heights/distances

trignometric identities

trignometric ratios at angle 30°

trignometric ratios at angle 45°

trignometric ratios at angle 60°

trignometric ratios for (90-theta)s

trignometric ratios for angle 0° (zero)

trignometric ratios for angle 90°

trignometry

wealth tax

withdrawl slip and cheque

MATHS SIGHT WORDS AND PHRASES

CAP - 10
Total 640 words only

Current (This Table) + Previous (CAP-9)
133 + 507= 640 words

EXERCISE:

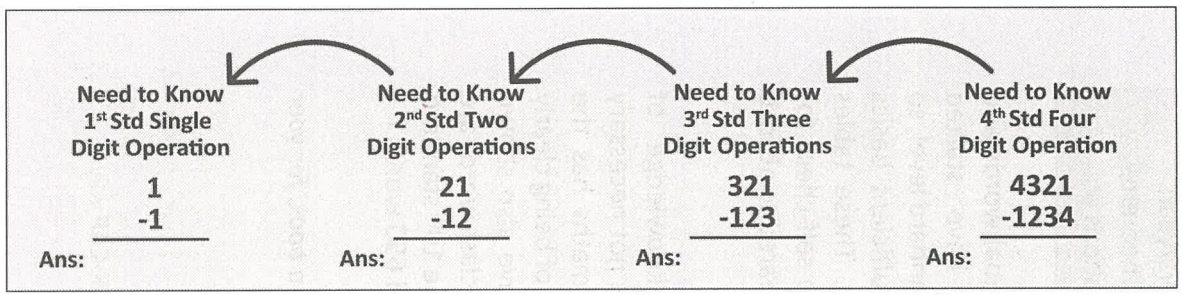
- ☞ MAKE YOUR OWN DICTIONARY at your class level X Using these words and meaning given in your text book.
- ☞ You will see your confidence in maths will be more now and start enjoying maths problem solving **FOLK-CAP** way.
- ☞ These tables may be used for translation into any other foreign language to have a BASIC MODEL for maths learning. The hesitation of doing maths is common among students across the globe.

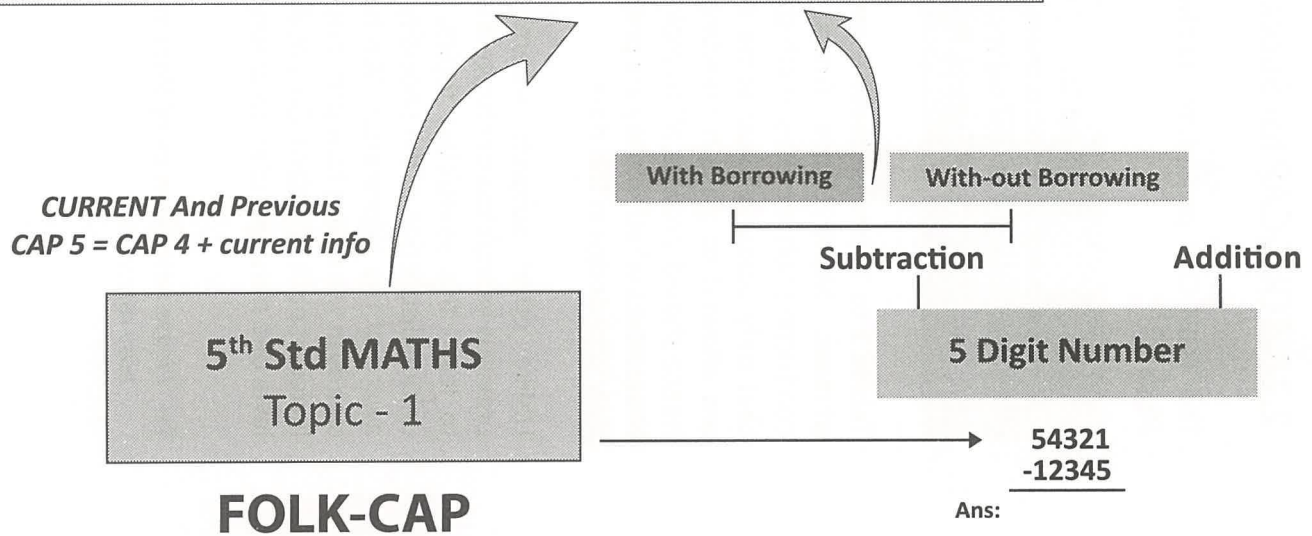
NOTE:

In other fields like English literature or History subjects this strict requirement is not there.

- ☞ In English you can study poetry without prose subject and vise-versa.
- ☞ In History you can study modern history without ancient and vise-versa.
- ☞ But this kind of hope and skip topics is not possible in Maths study.

HIGHLIGHTING THE IMPORTANCE OF CAP
CAP = CURRENT (THIS YEAR) + PREVIOUS YEARS MATHS KNOWLEDGE.





FOLK-CAP

Figure Out the Logic with Knowledge of Current And Previous

cont...

2.2.2. FOLK-CAP for Success in Maths

The FOLK-CAP procedure involves following 5 Steps: [16,17]

Step 1:
Be aware of previous chapters/years maths data w.r.t. Definitions, Theorems and Properties of Figures, Relations etc.

Tables 1 to 7 provide these essential words and phrases. Many States Govts. have started conducting public exams at 4th standard level, so that only students have some sufficient basics are allowed to go 5th standard. These tables hence should provide all to make self-check for themselves whether they are prepared to absorb new knowledge in the class.

Unlike other subjects where knowledge of previous years/class or chapters is not necessary to learn this years/class topics, maths has the unique distinction of the necessity of being clearly aware of the information. We have also shown clearly in the tables how previous class words are linked at each standard. Only at the 10th standard level one must get used to around 650 words !

Please note down all of them in a book, for your easy reference.

The process should start from middle school to higher secondary classes. B.Com./B.Sc./B.C.A./ B.I.T./B.E. students need to note only maths covered up to 10+2 level. Even GATE, GRE, GMAT, IIT entrance exams assume this much background in maths. The Maths sight word list presented above should facilitate everyone (for some it may just be a simple revision process) to become familiar with the vocabulary and script that are unique to maths.

Step 2:
Read the text / unit and spend some time in '**Figuring Out the Logic**' used in '**solved example**' in the Text /Unit.

- *Add to your collection the newly read topics, important results and new vocabulary learnt.*

Step 3 :

For any given problem, note down

i) data already given

ii) what is to be found / determined clearly.

iii) Wherever possible draw a sketch/ diagram indicating the above for better clarity of the problem.

iv) Be careful about signs, degrees or radians or pi etc. While solving problems in physics, chemistry, engineering and allied fields be careful about units and dimensions employed.

(ALL should be in the SAME SCALE!)

***Half** the problem is **solved** if this is done!*

Step 4:

Try to Figure Out the Logic / steps with Knowledge of Current (data given) And Previous chapters to solve the problem.

- *Stretch / strain your mind and imagination to arrive at the solution in stages.*
- *If you cannot 'figure-out' at the first go, put it aside.*
- *Keep thinking about it and come back to it.*
- *Review again the steps / logic used in the solved problems in the text.*
- ***Try again !***

Step 5:
If you can finally solve it on your own, isn't the feeling great?

- *Even solving the problem by discussing the difficult point with a friend or a family member is still a good effort for at least know you will have understood the logic involved.*
- ***Experience the Joy of Success in Maths!***

It is relevant to mention here the following point.

NOTE:

- ☞ No problem outside your syllabus.
- ☞ No short cuts or hop, skip and jump approach to study maths.
- ☞ Study in the sequence presented.
- ☞ Solve all problems given in the text. Only then will you have gained confidence in Maths.

---

*The hard work done now, **multiplies your ability** in many spheres of your life later on.*

To get a feel of what is being discussed try the example given below and self check your position!

2.2.3. Some Facilitating Self Check Exercises

Sl. No.	Question	Answer at first sight?
1.	$7 > 3$	True/ False
2.	$\frac{1}{7} > \frac{1}{3}$	True/ False
3.	$\frac{1}{7} + \frac{1}{3}$	Compute
4.	"1" a prime number	True/ False
5.	"0" a natural number	True/ False
6.	LCM x HCF = ?	for a pair of numbers
7.	$\frac{0}{a}$ =? and $\frac{a}{0}$ =?	
8.	$ax^2 + bx + c = 0$	Find Roots
9.	In a right angle triangle one angle is 30	Other angle ?
10.	Area = Length x Breadth	Figure?
11.	Area = ½ Base x Height	Figure?
12.	$\frac{d}{dx}(x^2) = 2x$	How?

one can go on citing examples

(CAP) Previous background one needs to know is elements of number theory for question 1 to 7. Basic Algebra for 8. Elements of Geometry for 9 to 11 and 12 requires basic calculus + concept of limits, differentials etc.

At 10 + 2 level every student need to be aware of

i) ~ 180 - theorems / corollaries in geometry.

ii) ~ 60 - properties / concepts in number theory and algebra.

iii) ~ 72 - integral / differential / trigonometry formulas.

- *Try to collect and make your own notes - maths guide.*

- *Every student should be able to **"Recognise them at first sight"**, apply and solve problems.*

2.3 Design of a '**Facilitating**' Maths Text Book

There is no dearth of books on mathematics. In this internet era, one can always find 'interesting' information and best rated titles through web sites like amazon.com, fabmart.com, sapnaonline.com etc. The number of students, parents and alike who are able to get hold of these are limited however, due to many factors like money, appropriate guidance and their own priorities.

In most cases, the only source for a student, in general, is his/her text book. We must improve their quality in their content and presentation. Drawing inspiration from the great mathematician David Hilbert's article on the famous 'unsolved problem list' at that time/era[18], we give below a list of points directed at improving the text books so as to facilitate very learner experience success.

Great strides have been in the area of imparting education through distance learning mode.[19] The basic pillar for success of this mode of learning is development of Self-Instructional Materials (SIMS).

The general format of presentation of any topic is shown in 2.3.1. Self-Instructional Materials (SIMS)

2.3.1. Self-Instructional Materials (SIMS)

1. **Objective**

   After studying this unit,

   You will be able to do : 1, 2, 3, 4...

2. **Topics**

   Section 1

   Section 2

   Sub Sections

   Section 3

   In- built Self-Check Exercises

3. **Summary**

4. **Glossary of Important New Terms**

5. **Terminal Question / Answers**

6. **References**

   The materials are prepared by a team of experts.

2.3.2 A similar format for Maths problem solving is indicated below

1. Statement of the problem

Left column **(CAP)**	Right column (steps to result)

2. Data given | **What to find/ prove**

a) _ _ _ _ _ _ _ _ _ _
b) _ _ _ _ _ _ _ _ _ _
c) _ _ _ _ _ _ _ _ _ _

i) _ _ _ _ _ _ _ _ _ _
ii) _ _ _ _ _ _ _ _ _ _
iii) _ _ _ _ _ _ _ _ _ _

3. Logical deductions

Logic : Reason - 1 We know that _ _ _ _ _ _ _ _ _ _ _ _	Intermediate Result - 1 _ _ _ _ _ _ _ _ _ _ _ _
Logic : Reason - 2 We know that _ _ _ _ _ _ _ _ _ _ _ _ As, because, for _ _ _ _ _ _ _ _ _ _ _ _	Intermediate Result - 2 _

4. Therefore | **Final result = Answer !**

(Left side: First reasons then) | (Right side: Steps leading to result)

- *It may look one has to **repeatedly write reasons** at every step for every problem.*
- *This is necessary **to prove to the reader** (evaluator of your work) **that you know** how exactly to solve the problem!*
- *It will also help the learner to master the important results and speeds up his ability to solve newer problems quickly.*

1. It is fervently hoped that Maths text books, in future, follow this general strategy.
2. Every student must be made aware of these Maths SIGHT WORDS.
3. Every textbook must include vocabulary index at that level (std.5 to std.10) with explanation. At the beginning of text chapters.
4. Where the math sight word **first appears**, it must be highlighted. (NIOS books has them). At the bottom of the page it's meaning to be given, so as reinforce the importance of the word.
5. A collection of theorems, properties, formulas

that is relevant to the standard must be printed in inside-front cover & inside-back cover of the book for easy reference and help in memorizing them. It is better to learn them clearly first and then forget them!

6. Newer approaches in teaching maths line Rule of three[4] : Graphical, Numerical and Algebraic representation to teach calculus topics and many other ideas be distilled into the school level books as well. This will enhance greater percentile of students appreciating the topics.

7. Include details of how answers are evaluated. Namely, tell clearly the **marking scheme**. This will help the students/parents and all to know clearly **what is expected** as a 'correct and complete' answer. This will avoid student's frustration of getting less than expected marks in exams.

8. All text books must be printed on a good quality paper (at least 70 GSM) in 2 - colors and 2 - column printing. Perhaps a 12-point size text with notes-recollection of earlier discussion repeated in 10-point print. Right-side column for Current text and left-side column for reminding Previous background. **(CAP)** [as shown above 3.1.2].

9. Since we have to reach all of the population,

we may come across difficulties peculiar to particular region error patterns in learning will have to be undertaken.[20,21]

10. Both for enrichment purposes as well as those trying to see maths in action references to popularizing maths[22-30] and some higher level text (first year BE/BCS/BCA/BSC Maths) be mentioned, also web sites to enable every one to become familiar (though not an expert) . Half the difficulty/fear of any subject is the 'unfamiliarity' of words (language) and script!

    For example, the Konkan Railway project document [31] has many interesting data of maths in action. The lucid details along with photographs is a joy to read. Every Indian must read it.

11. A National Maths web site, **with free access** to all, be started, where any and every question from public are answered positively within a stipulated time period.

12. Learners must be advised **not to refer** to cheap, heavily cramped so called **'guides'**, for they do not kindle the joy that one derives by solving problems on their own efforts. Thereby killing the very purpose of education viz. empowering you, as you grow, with knowledge to face the real world around you.

13. Like the famous proverb - Books never die! – every learner must **start** buying books and make his/her **own library collection**. References given below could well form a beginning in this life long activity.

2.4 Multi-Media Role

The recently introduced educational TV channel of India- GYANDHARSHAN - and Local Radio FM channel – GYAN VANI[32] be extensively used to teach problem solving techniques to learners of various standards/classes. What is suggested here is much different from that is currently being shown. We have to repeated show Sight Words, Logics employed in different cases (which clearly follow **FOLKCAP** scheme.) If such a approach is employed from beginning of 5th standard, by the time they reach 10th, they will have become very familiar with how to go about solving not only maths but also problems in physics, chemistry, business studies as well! They would have become good self-learners!

Now a days, we see a decline in admission to courses in basic sciences. One can perhaps reverse this trend by introducing some of the features presented in this work in other subjects. As a nation we require talents in all areas and only educated and motivated learners can bring laurels to the country.

2.5 Acknowledgments

I thank IGNOU for giving an unique opportunity to interact with a large number of academicians and academic administrators to know the various facets of **"what ails higher and school education"** in the country. These interactions kindled me to search for a solution to one the problems. My son B. S. Ashwin Kumar for raising many questions related to the above discussion. Mrs. Champaka and B. S. Deepak for facilitating to complete this work. My colleagues and staff at the regional center are thanked for their cooperation and patience (repeatedly hearing on this topic over the years 1995 - 2002).

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15. **B.S. Sudhindra , J.Ind.Inst.Sci., 67, 1-27 (1987); ibid, 70, 531-535(1990).**

16. Use of acronyms are a part of teaching and memorizing tools! They are coined to remember order of operations or a sequence of events etc. Perhaps the largest number of such items one sees in the field of Information Technology viz. Computer science, programming and Software engineering.

17. This approach has been extensively discussed and used by many teachers in Yawatmal District. [Pawar (Personal communication)] and regarded as 'direct approach' to solve maths problems (as compared to indirect approach used in school text books: G. Bhamburkar, Amaravati, 1 Nov 2001 (personal communication) see also The Hindu, 13 Nov, 2001.

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32. see www.ignou.ac.in or www.gyandarshan.ernet.in

As my aim is to reach billions in the country a basic version in Kannada and Hindi follows.

To help Kannada medium students important points of the method **FOLK-CAP** are given in English, on the left side of the pages for them to get used to English version as well.

The mathematician in U.... : Quantitative Reasoning!

Daily Maths in action .... A Brain Teaser

Frame *#9*

WHAT IS THE *PIN CODE*?

- A house wife forgot her bank account *PIN CODE* which is five digits number, but luckily she remembered some hints on how to recall this *PIN*.

Here are some of the clues:

1. The *1st* digit is a square of the *2nd*.
2. The sum of the *2nd* and *3rd* is 10.
3. The *4th* is equal to the *2nd* plus *1*.
4. The *3rd* and the *5th* makes *14*.
5. The sum of all the digits is *30*.

What is the *PIN CODE*?

Let a, b, c and e be the required code, then

1. Given a = b . b
2. b + c = 10; So c = 10 - b
3. d = b + 1
4. c + e = 14; So e = 14 - c
   E = 14 - (10 - b)
5. a+ b + c+ d + e = 30
   So substituting in-terms of b we get
   b.b + 2b + 15 = 30
   b.b + 2b - 15 = 0
   So, b = 3 satisfied above condition.
   So answer is 93747 meets required conditions 1 to 5. Given above. QED.

BSS-278, 08/11/2018

Please check your newspaper daily.

You will see 'common maths' in terms of quizes, word jumble, SODUKU etc.

Make it a habit to solve them.

This way you get a more confidence in Maths !

Latest Nero-science support for **FOLK-CAP** Way

Frame *#10*

PROOF OF BASIS OF FOLK CAP WAY [1996] ABOUT 20 YEARS LATER [2016]

https://www.thehindu.com/teatures/fridayreview/how-the-train-learns-to-read/article8737631.ece. Updated: June 16, 2016 22:12 IST

- Prof Dehaene concludes, [June 16, 2016] We think that the brain mechanisms are very universal. Children have the same basic layout of the brain circuits.
- We can help reading by enhancing their vocabulary and sound system of language.

https://in.reuters.com/article/us-usa-educationmath-idINBRE92B12320130312

- There were no major differences among white, black and Hispanic graduates who took intermediate and rigorous algebra courses.

Source: [Reuters] By Ian Simpson | WASHINGTON.

Lifestyle | Wed Mar 13, 2013 | 2:06am IST

Most algebra classes mislabelled as rigorous study.

My view: All can ENJOY MATHS

BSS, 15/11/2016. 11:29 pm

1. The hesitation to enjoy problem solving is not just in our country only.
2. It is a common problem across globe.
3. So the ideas presented here can be useful for all students across globe.

At Radio talktime....

Frame #11

ಗಣಿತ?

ಗ ➡ ಗಮನವಿಟ್ಟು

ಣಿ ➡ ಇಣಿಕಿ

ತ ➡ ತರ್ಕವ ನೋಡುವುದು/ಮಾಡುವುದು

ಗ ➡ **Mental ability**

ಣಿ ➡ **Hack / ace**

ತ ➡ **Logic involved**

BSS for AIR programme, 18, Oct, 2016. 2.30pm

* It is very difficult to create such expansions in different languages. The above one is just an example that one may try to suit an occasion to draw attention of the student.

PART-3:
KANNADA TRANSLATIONS OF FOLK-CAP WAY

ನೀವೂ ಗಣಿತವನ್ನು ಸುಲಭವಾಗಿ ಕಲಿಯಬಹುದು!

ಎಂಟನೆಯ ತರಗತಿಯ ನಂತರ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಗಣಿತ ವಿಷಯವನ್ನು ಕಡ್ಡಾಯವಾಗಿ ಕಲಿಸಬೇಕೇ ಬೇಡವೇ ಎಂಬ ಚರ್ಚೆ ಇದೀಗ ನಡೆದಿವೆ. ಗಣಿತ ಪರಿಜ್ಞಾನವುಳ್ಳವರು ನಮ್ಮ ದೇಶಕ್ಕೆ ಅಗತ್ಯವಾಗಿ ಬೇಕಾಗಿದ್ದಾರೆ. ಗಣಿತದ ಸಮಸ್ಯೆಗಳನ್ನು ಸುಲಭವಾಗಿ ಬಗೆಹರಿಸುವುದನ್ನು ಪ್ರತಿಯೊಬ್ಬರೂ ಕಲಿತುಕೊಳ್ಳಬಹುದೆಂದು ನನ್ನ ಅಭಿಪ್ರಾಯ. ಅದು ಹೇಗೆ ಎಂದು ನೋಡೋಣ.

ಕಲಿಯುವಿಕೆ ಎಂದರೆ ಅದೊಂದು ನಿಧಾನವಾದ ಪ್ರಕ್ರಿಯೆ. ಯಾವುದೇ ವಿಷಯವನ್ನು ಕಲಿಯಲು ನೀವು ಪ್ರಯತ್ನ ಪಡಬೇಕಾಗುತ್ತದೆ. ಅಲ್ಲದೆ ಕಲಿಯಲು ಸಮಯ ಹಿಡಿಯುತ್ತದೆ. ಅದರಲ್ಲೂ ಗಣಿತದಂಥ ವಿಷಯವನ್ನು ಕಲಿಯಲು ವಿದ್ಯಾರ್ಥಿ ಅಥವಾ ವ್ಯಕ್ತಿ ಹಿಂದಿನ ವರ್ಷಗಳಲ್ಲಿ ಅಥವಾ ಹಿಂದಿನ ಪಾಠಗಳಲ್ಲಿ ಕಲಿತಿರುವುದರ ಆಧಾರದ ಮೇಲೆ ಮುಂದಿನ ಕಲಿಕೆ ಸಾಧ್ಯವಾಗುತ್ತದೆ.

ಉದಾಹರಣೆಗೆ ಪ್ರಸಿದ್ಧವಾದ ಪೈಥಾಗೋರಾಸ್‌ನ ಪ್ರಮೇಯವನ್ನು ಅರ್ಥ ಮಾಡಿಕೊಳ್ಳಬೇಕಾದರೆ, ಕೋನಗಳು, ರೇಖೆಗಳು, ಭುಜಗಳು – ಇಂಥ ಪದಗಳನ್ನು ಅರ್ಥ ಮಾಡಿಕೊಂಡಿರಬೇಕು. ಆದರೆ, ಕೆಲವು ವಿಷಯಗಳಲ್ಲಿ ಇಂಥ ಅಗತ್ಯ ಉಂಟಾಗುವುದಿಲ್ಲ. ಉದಾಹರಣೆಗೆ ಆಧುನಿಕ ಇತಿಹಾಸವನ್ನು ಅಭ್ಯಾಸ ಮಾಡಬೇಕೆಂಬುವವರು ಪ್ರಾಚೀನ ಇತಿಹಾಸವನ್ನು ಅಧ್ಯಯನ ಮಾಡಿರಲೇಬೇಕೆಂದೇನೂ ಇಲ್ಲ.

FOLK-CAP details in slides.... 2

Frame *# 12*

BASIS FOR FOLK-CAP

- Every human being has an inbuilt logic software! Be proud to use it.
- Use of Maths SIGHT WORDS.
- Classifying SIGHT WORDS from class 5 to 10 separately.
- Emphasising use of **C**urrent **A**nd **P**revious years/classes Knowledge (concepts)
- Logical reasoning as the main basis for solving problems.
- Left (Reason) First _ sequence → Right (Result) Then Result

B.S. Sudhindra, 1995-2002

ಅದೇ ರೀತಿ ಕಾದಂಬರಿ, ಕಾವ್ಯ ಮುಂತಾದವುಗಳ ಪ್ರತ್ಯೇಕ ಅಧ್ಯಯನವನ್ನೇ ಮಾಡಬಹುದು. ಅಂತೆಯೇ ಚಿತ್ರಕಾರರು ತಮ್ಮ ಕಲ್ಪನಾಸಾಮರ್ಥ್ಯದಿಂದ ಚಿತ್ರ ರಚನೆಗಳನ್ನು ಮಾಡಬಲ್ಲರು.

ಗಣಿತದ ಸಮಸ್ಯೆಗಳನ್ನು ಪರಿಹರಿಸಲು ವ್ಯಕ್ತಿ ತನ್ನ ಹಿಂದಿನ ವರ್ಷಗಳ ಅಧ್ಯಯನವನ್ನು ಮನದಟ್ಟು ಮಾಡಿಕೊಂಡಿರಬೇಕು. ಇಲ್ಲಿ ಮೂರು ಮುಖ್ಯ ಅಂಶಗಳನ್ನು ಗಮನದಲ್ಲಿ ಇರಿಸಿಕೊಂಡಿರಬೇಕು.

i) ಆಯಾ ವಿಷಯದಲ್ಲಿ ಬರುವ ಪದಗಳು, ಪದಪುಂಜಗಳನ್ನು ಗಮನಿಸಿರಬೇಕು.

ii) ಗಣಿತದಲ್ಲಿ ಮುಖ್ಯವಾಗಿ ಬಳಸಲಾಗುವ ವಿಶೇಷ ಅಕ್ಷರಗಳು ಹಾಗೂ ಚಿಹ್ನೆಗಳ ಬಗ್ಗೆ ಚೆನ್ನಾಗಿ ತಿಳುವಳಿಕೆ ಇರಬೇಕು.

iii) ಆಯಾ ಕ್ಷೇತ್ರದ ಬಗ್ಗೆ ಪದ್ಧತಿಗಳು, ರೀತಿ ನೀತಿಗಳ ಪರಿಚಯ ಇರಬೇಕು.

ಗಣಿತದ ಸಂದರ್ಭದಲ್ಲಿ ಬಂದರೆ, ಒಂದು ಉತ್ತರ ಬಂದಿದ್ದರೆ, ಅದುಬರಬೇಕಾದರೆ ಅನುಸರಿಸಲಾದ ದಾರಿ ಯಾವುದು ಎಂಬುದನ್ನು ವಿಷದಪಡಿಸಬೇಕು.

ಪರಿಹಾರ ಮಾಡಲು ನಮಗೆ ಕೊಡಲಾದ ಒಂದು ಸಮಸ್ಯೆಗೆ ಹಲವಾರು ವಿಧಾನಗಳ ಮೂಲಕ ಪರಿಹಾರ ಸಾಧ್ಯವಿರಬಹುದಾದರೂ, ಪ್ರಸಕ್ತ ಲೇಖಕರುಈ ದಿಸೆಯಲಿ

FOLK-CAP ಎಂಬ ಹೆಸರಿನ ಪರಿಹಾರವನ್ನು ಕಂಡುಹಿಡಿದಿದ್ದಾರೆ. 5 ರಿಂದ 12ನೇ ತರಗತಿ (Class) ಯವರಿಗೆ ಮತ್ತು ಪದವಿಪೂರ್ವ ತರಗತಿಗಳಲ್ಲಿ ಓದುತ್ತಿರುವವರು, ಗಣಿತವನ್ನು ಬಿಡಿಸುವವರಿದ್ದಾರೆ ಮತ್ತು ಅದರಿಂದ ಸಂತೋಷ ಪಡುವವರಿದ್ದಾರೆ. ಅನ್ವಯಿಕ ಕ್ಷೇತ್ರಗಳಾದ ಭೌತಶಾಸ್ತ್ರ, ಮೆಕ್ಯಾನಿಕ್ಸ್ ವಿಷಯಗಳಲ್ಲೂ ಇಂಥ ಸಮಸ್ಯೆ ಇದೆ. ಅಲ್ಲಿಯೂ ಇದನ್ನೇ ಉಪಯೋಗಿಸಬಹುದು.

2. ಗಣಿತ ಎಂದರೇನು (Mathematics)?

ಮ್ಯಾಥಮ್ಯಾಟಿಕ್ಸ್ ಎಂಬ ಇಂಗ್ಲಿಷ್ ಪದವನ್ನು ಈ ರೀತಿಯಾಗಿ ನೋಡಬಹುದು. ಗುಣಾಕಾರದಲ್ಲಿ ಬರುವ ಸಮೀಕರಣಗಳನ್ನು ತೆಗೆದುನೋಡುವ ಮಾನಸಿಕ ಸಾಮರ್ಥ್ಯ.

ಮಾನಸಿಕ ಸಾಮರ್ಥ್ಯ. ಇದು ಎಲ್ಲರಿಗೂ ಇರುತ್ತದೆ. ಪ್ರತಿಯೊಬ್ಬ ವ್ಯಕ್ತಿಗೂ ತರ್ಕಬದ್ಧವಾಗಿ ಮಾತನಾಡುವ ಬುದ್ಧಿಯನ್ನಂತೂ ದೇವರು ದಯಪಾಲಿಸಿದ್ದಾನೆ. ಆ ಬುದ್ಧಿಯನ್ನು ಆಗಾಗ ಬಳಸಿಕೊಳ್ಳಬೇಕು, ಅಷ್ಟೇ. ಉದಾಹರಣೆಗೆ ಹಸಿವಾದಾಗ ಅಳುವ ಮಗು, ಇಲ್ಲವೆ ಮಗು ಅದೆಲ್ಲೋ ಆಟವಾಡಲು ಹೋಗಿ ಸಮಯಕ್ಕೆ ಸರಿಯಾಗಿ ಹಿಂತಿರುಗುವುದು.

2.1 ಮಕ್ಕಳಿಗೆ ಎಷ್ಟು ಪದಗಳು ತಿಳಿದಿರಬೇಕು ?

ಐದನೇ ತರಗತಿಯ ಪ್ರಾರಂಭದಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿ ಗಣಿತಕ್ಕೆ ಸಬಂಧಪಟ್ಟ 112 ಪದಗಳು ತಿಳಿದಿದ್ದರೆ ಸಾಕು. ಮುಂದಿನ ಒಂದೊಂದು ತರಗತಿಯಲ್ಲೂ ಕ್ರಮವಾಗಿ 62, 74, 76 ಮತ್ತು 64 ಹೀಗೆ 8ನೇ ತರಗತಿಯವರೆಗೆ ಪ್ರತಿ ವರ್ಷ ಪದಗಳನ್ನು

ಕಲಿಯುತ್ತಾ ಹೋಗಬೇಕು. 8ನೇ ತರಗತಿಯ ಕೊನೆಯಲ್ಲಿ 408 ಪದಗಳನ್ನು ಕಲಿತಿರಬೇಕು. 9ನೇ ತರಗತಿಯಲ್ಲಿ ಇನ್ನೂ 117 ಮತ್ತು 10ನೇ ತರಗತಿಯಲ್ಲಿ 119 ಪದಗಳನ್ನು ಸೇರಿಸಿ, ಕೊನೆಗೆ 650 ಪದಗಳ ಸಂಪತ್ತನ್ನು ಹೊಂದಿದ್ದರೆ ಸಾಕು. ಬೇರೆ, ಇಂಗ್ಲೀಷ್ ಮುಂತಾದ ಬಾಷೆಗಳಲ್ಲಿ ಒಬ್ಬ ವಿದ್ಯಾರ್ಥಿ ಕಲಿತುಕೊಳ್ಳಬೇಕಾದ ಪದಗಳ ಸಂಖ್ಯೆಗಳಿಗಿಂತ ಇದು ಬಹಳ ಕಡಿಮೆಯಾಯಿತು. ಅಲ್ಲದೆ, ಹಿಂದಿಯಲ್ಲಿ ಸಂವಹಿಸಲು ಹಿಂದಿ ಭಾಷೆಯ 500 ಪದಗಳು ಸಾಕಾಗುತ್ತದೆ.

3. Folk-Cap ಬಳಸಿ ಗಣಿತ ಸಮಸ್ಯೆ ಬಿಡಿಸಿರಿ

ಈ ವಿಧಾನದಲ್ಲಿ 5 ಹಂತಗಳಿರುವುದನ್ನು ತಿಳಿಯಬಹುದು.

1. ಹಂತ ಒಂದು:

ನೀವು ಹಿಂದೆ ಓದಿರುವ ಭಾಗಗಳು, ಗಣಿತದ ಅಂಕಿಅಶಗಳು (ಪದ–ಸಂಪತ್ತು) ವಿವರಣೆ (definition), ಪ್ರಮೇಯಗಳು – ಇವೆಲ್ಲವುಗಳ ಬಗ್ಗೆ ತಿಳಿದುಕೊಂಡಿರಿ. ನೆನಪಿನಲ್ಲಿ ಇರಿಸಿಕೊಂಡಿರಿ. ಅವುಗಳನ್ನೆಲ್ಲಾ ಒಂದು ಪುಸ್ತಕದಲ್ಲಿ ಗುರುತು ಮಾಡಿಕೊಂಡಿರಿ. ಇದು ನಿಮ್ಮ ಮಾಧ್ಯಮಿಕ ಶಾಲೆಯಲ್ಲಿ ಕಲಿತುದುದರಿಂದ ಪ್ರೌಢಶಾಲೆಯ ತನಕ ಕಲಿತ ವಿಷ ಯವಾಗಿರಬೇಕು.

ಬಿ.ಕಾ ಂ/ಬಿ.ಎ ಸ್.ಸಿ/ಬಿ.ಸಿ.ಎ./ಬಿ.ಐ.ಟಿ./ಬಿ.ಇ. ವಿದ್ಯಾರ್ಥಿಗಳು ತಮ್ಮ 10 + 2 ವರೆಗಿನ ಗಣಿತವನ್ನು ಮಾತ್ರ ಗುರುತು ಮಾಡಿಕೊಳ್ಳಬೇಕು. GATE, GRE, GMAT, ITI ಎಂಟ್ರೆನ್ಸ್ ಪರೀಕ್ಷೆಗಳನ್ನು ಬರೆಯಲು ಇಷ್ಟು ಮಾತ್ರದ ಗಣಿತಜ್ಞಾನವನ್ನು ಇರಿಸಿಕೊಂಡಿರಬೇಕು.

FOLK-CAP details in slides.... 4

Frame #13

FOLK-CAP INVOLVES 5 STEPS ...

Step 1

Be aware of previous chapters/years maths data w.r.t. Definitions, Theorems and Properties of Figures, Relations etc.

- For Standard V to X, see TABLES 1 to 7 given in the book.
- BPP students only upto 10 Std.
- B.Com./B.Sc./B.C.A students need to note only maths covered upto 10 + 2 level.
- Please note down all of them in a book, for your easy reference.
- In this revision process you will have become familiar with the vocabulary and script that are unique to maths.
- Easy to implement in Network mode also.

Step 2

*Read the text / unit and spend some time in **"Figuring Out the Logic"** used in 'solved example' in the Unit /text.*

- Add to your collection the newly read topics, important results and new vocabulary learnt.

B.S. Sudhindra, 1996

2. ಹಂತ ಎರಡು:
ಪಠ್ಯವನ್ನು ಓದಿಕೊಳ್ಳಿ. 'ಸಮಸ್ಯೆಯನ್ನು ಬಗೆಹರಿಸಲಾಗಿರುವ ಉದಾಹರಣೆ'ಯಲ್ಲಿ ಯಾವ ರೀತಿ 'ತರ್ಕಬದ್ಧವಾಗಿ ಬಿಡಿಸಿಕೊಂಡು ಹೋಗಿದ್ದಾರೆ' ಎಂಬುದನ್ನು ಸೂಕ್ಷ್ಮವಾಗಿ ಗಮನಿಸಿರಿ. ಇದನ್ನೇ Figuring Out the Logic (F-O-L) ಎನ್ನಲಾಗುತ್ತದೆ.

ಹೊಸದಾಗಿ ನೀವು ಓದಿದಂಥ ವಿಷಯಗಳು, ಮುಖ್ಯ ಪರಿಣಾಮಗಳು ಮತ್ತು ನೀವು ಕಲಿತ ಹೊಸ ಶಬ್ದಗಳನ್ನು ನಿಮ್ಮ ಶಬ್ದಭಂಡಾರಕ್ಕೆ ಸೇರಿಸಿಕೊಳ್ಳಿ.

3. ಹಂತ ಮೂರು:
ನಿಮಗೆ ಕೊಡಲಾದ ಸಮಸ್ಯೆಯಲ್ಲಿ ಈ ಕೆಳಗಿನ ಅಂಶಗಳನ್ನು ಗುರುತು ಮಾಡಿಕೊಳ್ಳಿ.

i) ಈಗಾಗಲೇ ನಿಮ್ಮಲ್ಲಿರುವ ಅಂಶ

ii) ಈಗ ಕಂಡು ಹಿಡಿಯಬೇಕಾದುದೇನು

iii) ಸಾಧ್ಯವಾದಲ್ಲಿ ಚಿತ್ರವೊಂದನ್ನು ಬರೆದುಕೊಳ್ಳಿ/ಇದರಿಂದ ಸಮಸ್ಯೆಯ ಸ್ಪಷ್ಟ ಚಿತ್ರಣ ನಿಮಗೆ ದೊರೆಯುತ್ತದೆ.

iv) ಡಿಗ್ರಿ, ರೇಡಿಯನ್ ಅಥವಾ ಪೈ ಮುಂತಾದ ಚಿಹ್ನೆಗಳ ಬಗ್ಗೆ ಜಾಗರೂಕರಾಗಿರಿ.

ಭೌತಶಾಸ್ತ್ರ, ರಸಾಯನಶಾಸ್ತ್ರ, ಅಭಿಯಂತರರಿಗೆ ಮತ್ತು ಇವುಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಕ್ಷೇತ್ರಗಳಲ್ಲಿರುವ ಸಂಬಂಧಿಸಿದ ಸಮಸ್ಯೆಗಳನ್ನು ಪರಿಹರಿಸುವಾಗ ಯೂನಿಟ್‌ಗಳು, ಡೈಮೆನ್ಷನ್

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Frame
 # 14

FOLK-CAP INVOLVES 5 STEPS ...

Step 3

- For any given problem, note down
  - ~ **data** already **given** and
  - ~ **what** is **to** be found/**determined** clearly.
  - ~ wherever possible draw a **sketch** / diagram indicating the above for better clarity of the problem.
- **Half** the problem is **solved** if this is done !

B.S. Sudhindra, 1996

(ಸುತ್ತಳತೆ)ಗಳ ಬಗ್ಗೆ ಗಮನವಿರಲಿ (ಎಲ್ಲದಕ್ಕೂ ಸ್ಕೇಲ್ ಒಂದೇ ಇರಲಿ).

ಇದನ್ನೆಲ್ಲಾ ಮಾಡಿದರೆ ಅರ್ಧ ಸಮಸ್ಯೆ ಬಗೆಹರಿದಂತೆಯೇ!

4. ಹಂತ ನಾಲ್ಕು:

ಸಮಸ್ಯೆಯನ್ನು ಪರಿಹರಿಸಲು, ತರ್ಕಬದ್ಧವಾಗಿ ಪ್ರಯತ್ನಿಸಿ. ಕೊಟ್ಟಿರುವ ಅಂಕಿ–ಅಂಶಗಳನ್ನು ಬಳಸಿಕೊಂಡು, ಪ್ರಸ್ತುತ ತಿಳಿದಿರುವ ಜ್ಞಾನದ ಮೂಲಕ (Current) ಮತ್ತು (And) ಹಿಂದಿನ (Previous) ಪಾಠಗಳಲ್ಲಿ ನೀವು ಕಲಿತಿರುವುದರ ಆಧಾರವನ್ನಿಟ್ಟುಕೊಂಡು (**CAP**) ಮುಂದುವರಿಯಿರಿ, ಹಂತಹಂತವಾಗಿ ಸಮಸ್ಯೆಯನ್ನು ಬಿಡಿಸುತ್ತಾ ಹೋಗಿ.

ತರ್ಕ: ಕಾರಣ 1

ಇದರ ಬಗ್ಗೆ ನಮಗೆ ತಿಳಿದಿದೆ. ಅದೇನೆಂದರೆ .....

ಇಷ್ಟರವರೆಗೆ ತಿಳಿದುದರ ಪರಿಣಾಮ (m_1)

ತರ್ಕ: ಕಾರಣ 2

ಈಗ ನಮಗೆ ಇಷ್ಟು, ಇಂಥ ವಿಷಯ ತಿಳಿಯಿತು, ಏಕೆಂದರೆ ಪರಿಣಾಮ (m_2)

ಆದ್ದರಿಂದ ಅಂತಿಮ ಪರಿಣಾಮ = ಉತ್ತರ (m_1)

ಅದೇನೆಂದರೆ, ಮೊದಲನೇ ಕಾರಣ .... ಪರಿಣಾಮಕ್ಕೆ ದಾರಿ.

$M = m_1 + m_2 = \ldots$ (ಪ್ರತಿ ಹಂತಕ್ಕೂ m_1 ಅಂಕಿಗಳು)

= ಸಮಸ್ಯೆಗೆ ಒಟ್ಟು ಅಂಕಗಳು.

ಈ ಹಂತಗಳಿಂದಾಗಿ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲು ಸಹಾ ಪಾರದರ್ಶಕತೆ ದೊರೆಯುತ್ತದೆ. ಅಂಕಗಳನ್ನು ಹೇಗೆ ಕೊಡಲಾಗಿದೆ ಎಂಬುದನ್ನು ವಿದ್ಯಾರ್ಥಿಯು, ಮೌಲ್ಯಮಾಪಕರೂ

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FOLK-CAP INVOLVES 5 STEPS ...

Step 4

*Try to **Figure Out the Logic / Steps with Knowledge of Current** (data given) **And Previous chapters** to solve the problem.*

- Stretch/strain your mind and imagination to arrive at the solution in stages.
- If you can not 'figure-out' at the first go, put it aside.
- **Keep thinking** about it and **come back** to it.
- Review again the steps/logic used in the solved problems in the text.
- **Try again !**

B.S. Sudhindra, 1996

(Evaluators) ಇಬ್ಬರೂ ತಿಳಿದು ಕೊಂಡಂತಾಗುತ್ತದೆ. ಮೊದಲ ಪ್ರಯತ್ನದಲ್ಲಿ ನಿಮಗೆ ಯಶಸ್ಸು, ಸಿಗಲಿಲ್ಲವಾದರೆ ಸಮಸ್ಯೆಯನ್ನು ಪಕ್ಕಕ್ಕೆ ಇಡಿ. ಅದರ ಬಗ್ಗೆ ಆಲೋಚನೆ ಮಾಡುತ್ತಾ ಇರಿ. ಆಮೇಲೆ ಪುನಃ ಅದನ್ನು ಕೈಗೆತ್ತಿಕೊಳ್ಳಿ ಎಲ್ಲಾ ಹಂತಗಳನ್ನು ಪುನರ್ವಿಮರ್ಶಿಸಿ. ಸಮಸ್ಯೆಯನ್ನು ಬಗೆಹರಿಸಲು ಬಳಸಿದ ತರ್ಕಬದ್ಧತೆಯನ್ನು ಆಲೋಚಿಸಿ.

ಪುನಃ ಪ್ರಯತ್ನಿಸಿ!

5. ಹಂತ–ಐದು:

ಕೊನೆಗೂ ನೀವು ಆ ಸಮಸ್ಯೆಯನ್ನು ಬಗೆಹರಿಸುವುದಾದರೆ ಮಹತ್ಸಾಧನೆ ಮಾಡಿದಂತೆ ನಿಮಗೆ ಅನಿಸುವುದಿಲ್ಲವೇ?

ಸಮಸ್ಯೆಗಳು ಪರಿಹಾರ ಕಂಡುಹಿಡಿಯಲು ಮಿತ್ರರೊಡನೆ, ಬಂಧುಗಳೊಡನೆ ಚರ್ಚಿಸಿ, ಅವರ ನೆರವನ್ನು ಪಡೆಯಬಹುದು. (ಈ ರೀತಿಯಾಗಿ ಗಣಿತವನ್ನು ಕಲಿಯುವ ಯಶಸ್ವಿಯಾಗುವ ಅನುಭವವನ್ನು ಪಡೆಯಿರಿ.)

ಪ್ರತಿ ಸಮಸ್ಯೆಯನ್ನು ಪರಿಹರಿಸುವಾಗ ಇರುವ ಪ್ರತಿ ಹಂತಕ್ಕೂ ಕಾರಣಗಳನ್ನು ಪದೇ ಪದೇ ಬರೆಯುತ್ತಿರಬೇಕು. ನಿಮ್ಮ ಕೆಲಸವನ್ನು ಮೌಲ್ಯಮಾಪನ ಮಾಡುವವರಿಗೆ ನೀವು ಯಾವ ರೀತಿಯಲ್ಲಿ ಸಮಸ್ಯೆಯನ್ನು ಪರಿಹಾರ ಮಾಡಿದ್ದೀರಿ ಎಂಬುದು ಮನವರಿಕೆಯಾಗಬೇಕಾದರೆ ನೀವು ಪ್ರತಿ ಹಂತವನ್ನೂ ಬರೆಯಬೇಕು. ನಿಮಗಾದರೂ ಇದರಿಂದ ಹೊಸ ಹೊಸ ಸಮಸ್ಯೆಗಳನ್ನು ಆತ್ಮವಿಶ್ವಾಸದಿಂದ ಬಗೆಹರಿಸಲು ಪ್ರಯತ್ನಪಡಲು ಸಹಾಯಕವಾಗುತ್ತದೆ.

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Frame
 # 16

FOLK-CAP INVOLVES 5 STEPS ...

Step 5

If you can** finally solve it **on your own**, isn't the **feeling great?** ..... **(Experience the Joy of Success in Maths!)

Note:

1. No problem outside your syllabus.
2. No shortcuts or hop, skip and jump approach to study maths.
3. Study in the sequence presented.
4. Solve all the problems given in the text.

Only then you will have gained confidence in Maths.

- Like in the initial stages of learning 'bicycling' the above procedures may appear difficult, but as you go by the whole Reading / Writing / Maths process becomes easy.
- You will have **cultivated good habits !**

B.S. Sudhindra, 1996

ಕೆಲವೊಂದು ಸರಳಗೊಳಿಸುವ ಅಂಶಗಳು
(Some Simplifying Factors)

1. ನಿಮ್ಮ ಪರಿವಿಡಿಯಿಂದ ಹೊರತಾದ ಯಾವುದೇ ಸಮಸ್ಯೆಗಳು ಬರುವುದಿಲ್ಲ.
2. ಗಣಿತದ ಅಭ್ಯಾಸದಲ್ಲಿ ಯಾವಾಗಲೂ ಯಾವುದೇ ಅಡ್ಡದಾರಿ, ಹಾರಿ, ನೆಗೆದು ಮಾಡುವಂತಿಲ್ಲ.
3. ಒಂದು ಸರಿಯಾದ ವ್ಯವಸ್ಥೆಯಲ್ಲಿ ಅಧ್ಯಯನ ಮಾಡಿ.
4. ಪಠ್ಯಪುಸ್ತಕದಲ್ಲಿ ಕೊಡಲಾಗಿರುವ ಎಲ್ಲಾ ಸಮಸ್ಯೆಗಳನ್ನೂ ಪರಿಹಾರ ಮಾಡಿ. ಆಗ ಮಾತ್ರ ನಿಮಗೆ ಗಣಿತದಲ್ಲಿ ಆತ್ಮವಿಶ್ವಾಸ ಮೂಡುತ್ತದೆ. ಈಗ ನೀವು ಕಷ್ಟಪಟ್ಟು ಮಾಡುವ ಕೆಲಸದಿಂದಾಗಿ ಮುಂದೆ ನಿಮ್ಮ ಜೀವನದ ಹಲವು ಸ್ತರಗಳಲ್ಲಿ ಕೆಲಸ ಮಾಡಲು ನಿಮ್ಮ ಸಾಮರ್ಥ್ಯವನ್ನು ಹೆಚ್ಚಿಸುತ್ತಾ ಹೋಗುತ್ತದೆ.

ಇಲ್ಲಿಯವರೆಗೂ ನಾವು ಚರ್ಚಿಸಿದುದನ್ನು ಆಚರಣೆಗೆ ತರಲು ಈ ಕೆಳಗಿನ ಉದಾಹರಣೆಯನ್ನು ಪ್ರಯತ್ನಿಸಿ ಪರೀಕ್ಷಿಸಿ ನೋಡಿ.

4. ಅನುಕೂಲಕರವಾದ ಕೆಲವು ಸ್ವತಃ ಪರೀಕ್ಷೆ ಮಾಡಬಲ್ಲ ಸಮಸ್ಯೆಗಳು:

ಪ್ರಶ್ನೆ: ನೋಡಿದೊಡನೆಯೇ ಉತ್ತರಿಸಿ:

1.	$7 > 3$	ಸರಿ/ತಪ್ಪು
2.	$\frac{1}{7} > \frac{1}{3}$	ಸರಿ/ತಪ್ಪು
3.	$\frac{1}{7} + \frac{1}{3}$	ಕೂಡಿರಿ
4.	"1" ಇದೊಂದು ಪ್ರೈಮ್ ಸಂಖ್ಯೆ	ಸರಿ/ತಪ್ಪು
5.	"0" ಇದೊಂದು ನೈಸರ್ಗಿಕ ಸಂಖ್ಯೆ	ಸರಿ/ತಪ್ಪು
6.	LCM x HCF = ?	ಒಂದು ಜೋಡಿ ಸಂಖ್ಯೆಗಳು
7.	$\frac{0}{a}$ =? ಮತ್ತು $\frac{a}{0}$ =?	
8.	$ax^2 + bx + c = 0$	ಬೀಜಧಾತುಗಳನ್ನು (Roots) ಕಂಡುಹಿಡಿಯಿರಿ.
9.	ಸಮಕೋನ ತ್ರಿಭುಜದಲ್ಲಿ ಒಂದು ಕೋನ 30^0	ಇನ್ನೊಂದು ಕೋನ?
10.	ವಿಸ್ತಾರ = ಉದ್ದ x ಅಗಲ	ಚಿತ್ರ ?
11.	ವಿಸ್ತಾರ = ಬೇಸ್ x ಎತ್ತರ	ಚಿತ್ರ ?
12.	$\frac{d}{dx}(x^2) = 2x$	ಇದು ಹೇಗೆ ?

ಇಂತಹ ಹಲವು ಉದಾಹರಣೆಗಳನ್ನು ಕೊಡುತ್ತಾ ಹೋಗಬಹುದು.

ಹಿಂದಿನದು ಮತ್ತು ಈಗಿನದು 1 ರಿಂದ 7ನೇ ಪ್ರಶ್ನೆಗಳನ್ನು ಉತ್ತರಿಸಬೇಕಾದರೆ ಸಂಖ್ಯಾ ಥಿಯರಿಯ ಬಗ್ಗೆ ತಿಳಿದುಕೊಂಡಿರಬೇಕು. 8ನೇ ಪ್ರಶ್ನೆಗೆ ಬೀಜಗಣಿತದ ಪ್ರಾಥಮಿಕ ಜ್ಞಾನ ಇರಬೇಕು. 9 ರಿಂದ 12 ಪ್ರಶ್ನೆಗಳಿಗೆ ಜ್ಯಾಮಿತಿಯ ವಿಷಯದ ತಿಳುವಳಿಕೆ ಬೇಕು. 12ನೇ ಪ್ರಶ್ನೆಗೆ ಪ್ರಾಥಮಿಕ ಕ್ಯಾಲ್ಕುಲಸ್, ಮಿತಿ, ಡಿಫರೆನ್ಷಿಯಲ್ಸ್ ಮುಂತಾದವುಗಳ ಪರಿಚಯ ಇರಬೇಕಾಗುತ್ತದೆ.

10 + 2ರಲ್ಲಿ ಪ್ರತಿಯೊಬ್ಬ ವಿದ್ಯಾರ್ಥಿಯೂ ಈ ಕೆಳಗಿನ ಅಂಶಗಳನ್ನು ತಿಳಿದುಕೊಂಡಿರಬೇಕು. ಅವಧಿ

i) 180ಕ್ಕೆ ಕಡಿಮೆಯಲ್ಲದ ಪ್ರಮೇಯಗಳು/ಜ್ಯಾಮಿತಿಯಲ್ಲಿನ ಉಪಸಿದ್ಧಾಂತಗಳು.

ii) 60ಕ್ಕೆ ಕಡಿಮೆಯಲ್ಲದ ಸಂಖ್ಯಾ ಥಿಯರಿ ಪ್ರಕಲ್ಪಗಳು ಮತ್ತು ಬೀಜಗಣಿತ.

iii) 72ಕ್ಕೆ ಕಡಿಮೆಯಿಲ್ಲದ ಇಂಟೆಗ್ರಲ್/ ಡಿಫರೆನ್ಷಿಯಲ್/ ಟ್ರಿಗೋನೊಮೆಟ್ರಿ ಫಾರ್ಮುಲಾಗಳು.

ಹೆಚ್ಚಿನ ಟಿಪ್ಪಣಿಗಳನ್ನು ಸಂಗ್ರಹಿಸಿ, ನಿಮ್ಮದೇ ಟಿಪ್ಪಣಿಗಳನ್ನು ಬರೆದಿಟ್ಟುಕೊಳ್ಳಿ–ಮ್ಯಾಥ್ಸ್ ಗೈಡ್.

ಪ್ರತಿ ವಿದ್ಯಾರ್ಥಿಯೂ ಸಮಸ್ಯೆಗಳನ್ನು ನೋಡಿದಾಗ 'ಪ್ರಥಮ ನೋಟದಲ್ಲೇ ಪತ್ತೆ ಹೆಚ್ಚುವಷ್ಟು' ಪರಿಣತಿ ಪಡೆದು ಪರಿಹಾರ ಮಾಡಲು ಸಮರ್ಥನಾಗಬೇಕು.

5. ವಿದ್ಯಾರ್ಥಿಯ ಯಶಸ್ಸನ್ನು ಕೇಂದ್ರೀಕರಿಸಿದ ಪಠ್ಯಪುಸ್ತಕ

ಇಂಥ ಬೋಧನ ವಿಧಾನದ ಗಣಿತವನ್ನು ಬೋಧಿಸಲು ಆಚರಣೆಗೆ ತರಬೇಕಾದರೆ, ಪಠ್ಯಪುಸ್ತಕದ ಮುದ್ರಣ ಬೇರೆಯೇ ವಿನ್ಯಾಸವನ್ನು ಹೊಂದಬೇಕಾಗುತ್ತದೆ. ಈ ವಿನ್ಯಾಸವನ್ನು 'ವಿದ್ಯಾರ್ಥಿಯ ಯಶಸ್ಸನ್ನು ಕೇಂದ್ರೀಕರಿಸಿದ ಪಠ್ಯಪುಸ್ತಕ ವಿನ್ಯಾಸ' ಅಗತ್ಯವಾಗುತ್ತದೆ. ಇದರಲ್ಲಿ 4 ಕಾಲಂಗಳು ಇರುತ್ತವೆ.

i) 9 ಸೆಂ.ಮೀ. ಅಗಲದ ಮುಖ್ಯ ಪಠ್ಯವನ್ನೊಳಗೊಂಡ, ಹಿಂದಿನ ಮಾಹಿತಿಯನ್ನೊಳಗೊಂಡ, ಮತ್ತು ಮುಂದಿನ ಕಾಲಂ ಇರುತ್ತದೆ. ಇದರಿಂದ ಓದುಗನ ಕಣ್ಣು ಬಹಳವಾಗಿ ಅತ್ತಿತ್ತ ಚಲಿಸಿ ಆಯಾಸಕ್ಕೊಳಗಾಗದೆ, ತಲೆಯ ಚಲನೆಯೂ ಅತ್ತಿತ್ತ, ಆಗದೆ, ಕೇಂದ್ರೀಕೃತ (focused) ವಾಗಿ ಓದಲು ಅವಕಾಶವಾಗುತ್ತದೆ.

ii) ಎಡಭಾಗದಲ್ಲಿ 3 ಸೆಂ.ಮೀ. ಕಾಲಂನಲ್ಲಿ ಹಿಂದಿನ ಮಾಹಿತಿ ದೊರಕುವ ಸೌಲಭ್ಯ ಇರುತ್ತದೆ.

iii) ಬಲಭಾಗದಲ್ಲಿ 3 ಸೆಂ.ಮೀ. ಕಾಲಂನಲ್ಲಿ 'ಸಂಬಾಧಿತ ಅಂಶಗಳು, ಅನ್ವಯ ಮಾಡಬಹುದಾದಂಥ (application) ಕ್ಷೇತ್ರಗಳ ಬಗ್ಗೆ ಮಾಹಿತಿ ಇರತಕ್ಕದ್ದು. ಆಗಾಗ ಕೇಳಲಾಗುವ ಪ್ರಶ್ನೆಗಳ (MCQ) ಸಂಬಂಧವಾಗಿಯೂ ಇಲ್ಲಿ ಮಾಹಿತಿ ಇರಬಹುದು.

iv) ಪ್ರತಿಪುಟದ ಕೆಳಭಾಗದಲ್ಲಿ ಸುಮಾರು 5 ಸೆಂ.ಮೀ. ಎತ್ತರದ ಮತ್ತು ಪೂರ್ಣಕಾಲಂನ (3+ 9 + 3) ಫುಟ್‌ನೋಟ್ ಇರಬೇಕು. ಇಲ್ಲಿ ಒತ್ತಿ ಹೇಳಬೇಕಾದಂಥ ವಿಷಯಗಳನ್ನು ಕೊಡಬಹುದು.

ಪಠ್ಯಪುಸ್ತಕ ಮುದ್ರಣ ಮಾಡುವವರಿಗೆ ಇದರಿಂದ ಯಾವುದೇ ಸಮಸ್ಯೆ ಇರುವುದಿಲ್ಲ. ಆದರೆ ಪಠ್ಯ ಪುಸ್ತಕ ತಾರಿಕೆ ಮಾಡುವ ಶಿಕ್ಷಕರು, ಬರಹಗಾರರು ವಿದ್ಯರ್ಥಿಗಳ ಹಿತದೃಷ್ಟಿಯಿಂದ ಹೆಚ್ಚಿನ ಪ್ರಯತ್ನ ಪಡಬೇಕಾಗುತ್ತದೆ. ಪ್ರತಿಪುಟದಲ್ಲೂ ಹೆಚ್ಚು ಮಾಹಿತಿ ಕೊಟ್ಟು ಉತ್ತಮ ಶಿಕ್ಷಕರ ಬೋಧನೆಯನ್ನು ಅಚ್ಚು ಮಾಡಿದಂತೆ ಇರುತ್ತದೆ.

6. ಸಂಪನ್ಮೂಲ

ಒಟ್ಟಿನಲ್ಲಿ ಗಣಿತದ ಅಭ್ಯಾಸ, ಅಧ್ಯಯನವನ್ನು ಮಾಡಲು ಭಯಪಡದೆ, ಲಕ್ಷಾಂತರ ಜನ ಸುಲಭವಾಗಿ ಕಲಿಯಬಹುದು. ದಯವಿಟ್ಟು ನೆನಪಿರಲಿ: **'ಶಿಕ್ಷಣದಲ್ಲಿ, ಅನ್ಯೋನ್ಯತೆ ಆತ್ಮವಿಶ್ವಾಸ ಮೂಡಿಸುತ್ತದೆ.'**

ಡಾ॥ ಸುಧೀಂದ್ರ ಅವರ ಕಲಿಯುವವರಿಗೆ ಯಶಸ್ವಿಯನ್ನು ಕಲಿಸುವ ಪಠ್ಯಪುಸ್ತಕ ಪುಟ ವಿನ್ಯಾಸ

3 ಸೆಂ.ಮೀ. ಅಗಲದ ಕಾಲಂ ಹಿಂದಿನ ಮಾಹಿತಿ	9 ಸೆಂ.ಮೀ. ಅಗಲದ ಕಾಲಂ ಕಣ್ಣು/ತಲೆಯನ್ನು ಹೆಚ್ಚು ಚಲನೆ ಮಾಡದೆ ಪಠ್ಯವನ್ನು ಸುಲಭವಾಗಿ ಓದಲು ಸಾಧ್ಯ **(ಕೇಂದ್ರೀಕರಿಸಿದ ಓದನ್ನು ಸಾಧ್ಯವಾಗಿಸುತ್ತದೆ)**	3 ಸೆಂ.ಮೀ. ಅಗಲದ ಕಾಲಂ ಈ ಆಧಾರದ ಮೇಲೆ ಕೂಡಿರುವ ಉದಾಹರಣೆಗಳನ್ನು ನೋಡಿ. (MCQs) ಖಾಲಿ ಇರಬಹುದು.

ಅಡಿ ಟಿಪ್ಪಣಿ: ಪ್ರತಿ ಹೊಸ ಪದಕ್ಕೂ ಥಿಯರಂ ತತ್ವಗಳಿಗೆಲ್ಲಾ ಅಂಕಿಯನ್ನು ಕೊಡಿ, ಸಂಬಂಧಿಸಿದ ಆಗಾಗ ಕೇಳಲಾಗುವ ಪ್ರಶ್ನೆಗಳಿಗೆ (MCQs) ಉತ್ತರಗಳನ್ನು ಆ ಪುಟದಲ್ಲಿಕೊಡಿ.

Misconception 3 ..... No Maths !

Frame #17

FOR AN ATHLETE, PHYSICAL EDUCATION IS MORE IMPORTANT THAN PHYSICS .... A MISCONCEPTION

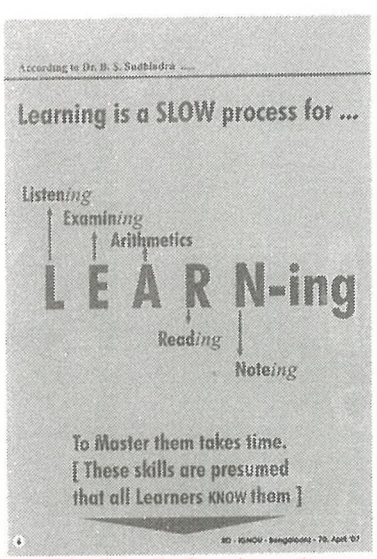
- Knowing Physics (and Maths) will help him in building better techniques/performance !
- **Remember:** Human body is a 'complex machine'. When injuries occur treatment has inbuilt- physics principles! ..... Bio-mechanics!

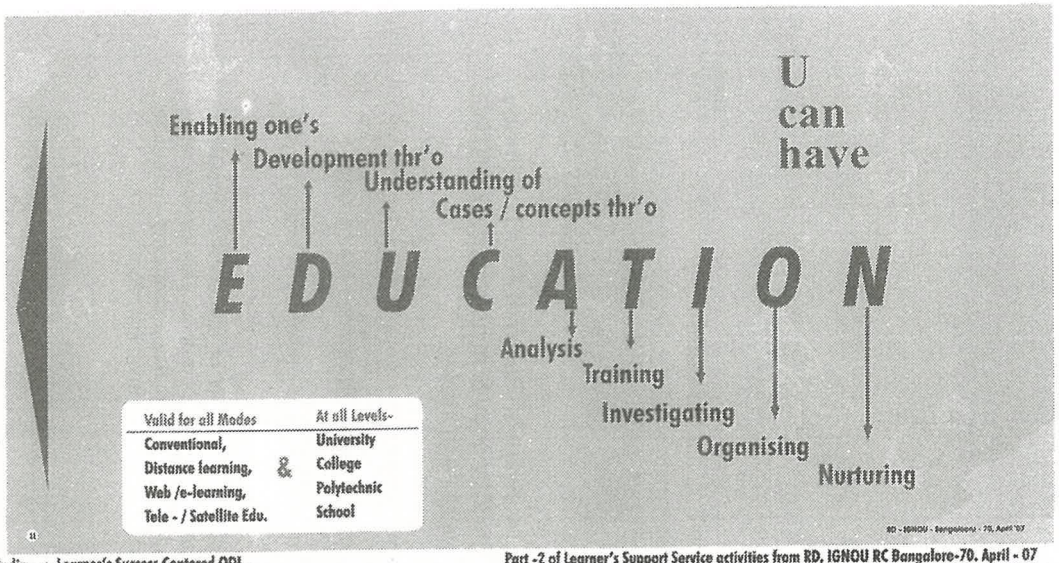
Examples:

Knee caps, Joint replacements, rods to support hand etc.
Shoes one wears ... running ,
games.. Ice hockey etc.
[Sizes ... right fit/pressure etc... measurements are Maths in Action!]

BSS-13, 19/01/2017, 10.07 pm

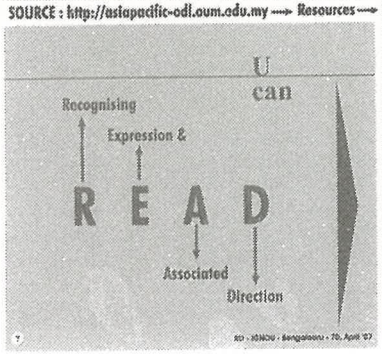
ADOPT THESE **ELEMENTS** TO GET BEST GRADES!

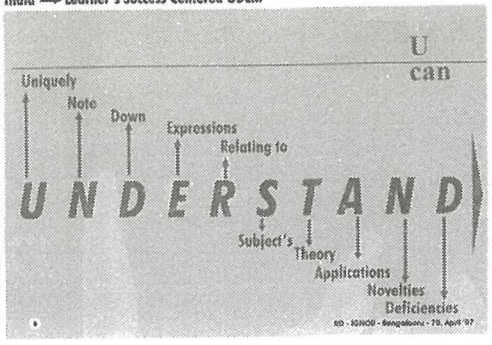


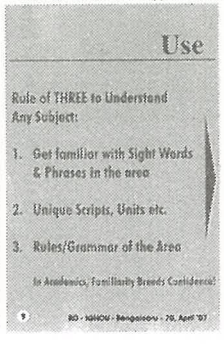


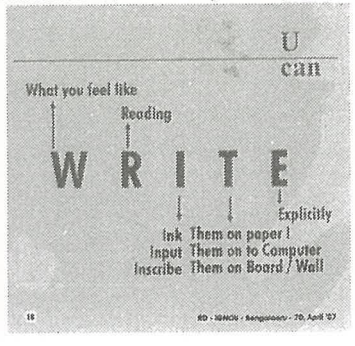
SOURCE : http://asiapacific-odl.oum.edu.my ⟶ Resources ⟶ India ⟶ Learner's Success Centered ODL...

Part -2 of Learner's Support Service activities from RD, IGNOU RC Bangalore-70. April - 07









Making Maths Digestible to Billions ..... **FOLK-CAP** way

Misconception 2 ..... No Maths !

Frame *# 18*

FOR A MUSICIAN WHO DOESN'T NEED CHEMISTRY ..... A MISCONCEPTION

- Must be aware of 'Relevant FOOD Chemistry' for a healthy body & mind requires CONTROL on type of Food intake!

Remember

~ Life is Chemistry + Medicine + Mathematics !

~ Food interaction is Chemistry in action in your body!

~ Hidden Maths: Use of appropriate amount of ingredients to prepare food. This involves ratios and proportions, makes a good chef - inturn he has mathematical mind in action!

BSS-13, 19/01/2017, 10.07 pm

PART-4:
HINDI TRANSLATIONS OF FOLK-CAP WAY

हर कोई गणित का आनंद ले सकता है!

'फ़ोककैप' (FOLKCAP) की मदद से गणित की समस्याओं को हल करने का आनंद लीजिए।

प्रो. डॉ. बी. एस. सुधीन्द्र

जनसामान्य के लिए गणित

आज इस बात पर काफ़ी बहस चल रही है कि आठवीं कक्षा के बाद गणित के विषय को अनिवार्य बनाया जाए या वैकल्पिक। एक राष्ट्र के रूप में हमें एक गणित जानने वाले समाज की ज़रूरत है। मुझे लगता है कि गणित की समस्याओं को हल करने में मिलने वाली ख़ुशी एक ऐसी चीज़ है जो हर कोई अपने अन्दर विकसित कर सकता है - आइए देखें कि ऐसा कैसे हो सकता है।

सीखना एक धीमी प्रक्रिया है। किसी भी विषय को समझने के लिए आपको समय देना पड़ता है और कोशिश करनी होती है। गणित एक ऐसा अनूठा विषय है जिसमें पिछले अध्यायों/वर्षों में सीखा गया ज्ञान आज के विषय को समझने के लिए एक ज़रूरी पूर्वशर्त है। उदाहरण के लिए, पाइथागोरस के प्रसिद्ध प्रमेय का हमारे लिए कोई मतलब नहीं होगा अगर हम कोण, भुजाएँ और आकृतियों जैसे शब्दों से परिचित नहीं हैं। दूसरे विषयों में इस तरह की पहले से मौजूद जानकारी ज़रूरी नहीं होती है। उदाहरण के लिए, अगर पहले के इतिहास का ज्ञान न हो, तो भी आधुनिक इतिहास का अध्ययन किया जा सकता है। इसी तरह, कहानी, कविता आदि का अलग-अलग अध्ययन किया जा सकता है। कलाकारों के पास भी पेंटिंग बनाने के लिए पहले से ही तर्कपूर्ण कल्पना मौजूद होती है। गणित

की समस्याओं को हल करने का आनंद लेने के लिए व्यक्ति को पिछले वर्षों के अध्ययन से परिचित होना पड़ता है। यह सब आसानी से किया जा सकता है बशर्ते कि 'हम तीन के नियम' को याद रखें। यानी आपको आपका इन तीन बातों से परिचित होना चाहिए :

1. विषय से संबंधित दृश्य शब्द और वाक्यांश।
2. आम तौर पर उपयोग की जाने वाली खास लिपियों/संकेतों से परिचित होना।
3. खेल/क्षेत्र के नियमों से परिचित होना - रीतियाँ, अनुक्रम आदि, हमारे मामले में यह वह तर्क या लॉजिक है जिसे लागू करके या जिसका अनुसरण करके जवाब/हल तक पहुँचा जाता है।

हालाँकि किसी सवाल को हल करने के कई तरीके हो सकते हैं, इस लेखक ने एक कार्यविधि विकसित की है, जिसे फ़ोक-कैप)FOLK-CAP), [Sudhindra, 1996] का नाम दिया गया है, जिसे गणित के सवालों को हल करने और उनका आनंद लेने के लिए स्कूल [V से XII] और पूर्व-स्नातक [M1, M2,M3] की पूरी समयावधि में एकसमान ढंग से में लागू किया जा सकता है। इसमें प्रायोगिक क्षेत्र, जैसे भौतिकी, यांत्रिकी आदि भी शामिल हैं।

गणित क्या है?

मेरा मानना है, कि इस शब्द को इस तरह से देखा जा सकता है :

गुणा, जोड़ना, उनके विपरीत [भाग, घटाना] के समीकरणों को सही ढंग से और क्रमानुसार हल करने की मानसिक योग्यता! (Mental Ability to Hack Equations in Multiplication, Addition , Their Inverses [division, subtraction] Correctly and Sequentially !]

मानसिक योग्यता सभी के पास होती है! सौभाग्य से, या यूँ कहें कि भगवान की कृपा से, वह लॉजिक सॉफ्टवेयर सभी में जन्म से ही मौजूद रहता है! हमें बस उसे बार-बार उपयोग में लाना होता है। उदाहरण के लिए, किसी बच्चे का भोजन आदि के लिए रोना, या किसी बच्चे का खेलने/खरीदारी करने/स्कूल के लिए बाहर जाना और वापस लौट कर घर आना आदि, इन सभी में हमारे भीतर मौजूद लॉजिक का इस्तेमाल होता है।

अब अगर दृश्य शब्दों और वाक्यांशों की बात करें, तो पाँचवी कक्षा की शुरुआत में केवल 112 शब्द जानने ज़रूरी हैं। जैसे-जैसे विद्यार्थी एक-एक कक्षा से होकर गुज़रता है, हर कक्षा में 62, 94, 76, 64 शब्द [आठवीं कक्षा पूरे होने तक कुल केवल 408 शब्द] और IX और X में 117 और 119 नए शब्द और वाक्यांश जुड़ते जाते हैं, जो कुल मिलाकर लगभग 650 शब्द ही होते हैं! [Sudhindra, 2003]. दसवीं कक्षा में विद्यार्थी को अंग्रेज़ी के 2000 से अधिक शब्दों से परिचित होना पड़ता है, जिसकी तुलना में यह संख्या ज़्यादा बड़ी नहीं है। इसके अलावा हिंदी में बुनियादी स्तर पर बातचीत करने के लिए करीब 500 शब्द आने चाहिए।

फ़ोक-कैप का इस्तेमाल करके सवालों को हल करने का आनंद लें

फ़ोक-कैप कार्यविधि में निम्नलिखित 5 चरण शामिल हैं:

चरण : 1.

पिछले अध्यायों/वर्षों के गणित के डेटा को जानें [शब्दावली और स्क्रिप्ट] परिभाषाएं, प्रमेय और आकृतियों के गुण, सम्बन्ध आदि के बारे में।

इन सभी को एक नोटबुक में लिख लीजिए ताकि आप आसानी से उनको देख सकें।

यह प्रक्रिया मिडिल स्कूल से शुरू होकर हाई स्कूल तक चलनी चाहिए।

बी.कॉम./बी.एससी./बी.सी.ए./बी.आई.टी./बी.ई. के विद्यार्थियों को केवल 10+2 के स्तर तक पढ़ाए गए गणित को नोट करना चाहिए। GATE, GRE, GMAT, IIT की प्रवेश परीक्षाओं में भी मानकर चला जाता है कि गणित में इतनी पृष्ठभूमि है।

चरण : 2.

टेक्स्ट/यूनिट को पढ़ें और टेक्स्ट/यूनिट में दिए गए "हल किए गए उदाहरणों" में इस्तेमाल किये गए "तर्क को समझने" (Figuring Out the Logic) में कुछ समय दें।

पढ़े गए नए विषयों, महत्वपूर्ण परिणामों और सीखी गई नए शब्दावली को अपने संग्रह में जोड़ें।

चरण : 3.

दिए गए किसी भी सवाल के लिए, नोट करें

i. पहले से दिया गया डेटा
ii. स्पष्ट रूप से क्या पता करना/निर्धारित करना है।
iii. जहाँ भी सम्भव हो, एक रेखाचित्र/डायग्राम बनाएं, जिसमें सवाल को और स्पष्ट करने के लिए ऊपर की चीज़ों को दिखाया गया हो।
iv. चिह्नों, डिग्री या रेडियन या पाई आदि पर ध्यान दें। भौतिकी, रसायनशास्त्र, इंजीनियरिंग और इनसे सम्बन्धित क्षेत्रों के सवाल हल करते समय प्रयोग की गई इकाइयों और आयामों पर ध्यान दें (सभी एक ही स्केल में होने चाहिए!)

इसे कर लिया तो समझिए कि आधा सवाल हल हो गया!

चरण : 4.

सवालों को हल करने के लिए वर्तमान (दिया गया डेटा) और पिछले पाठों के ज्ञान से तर्क/चरणों को समझने की कोशिश करें।

चरणों से होकर हल तक पहुँचने के लिए अपने मस्तिष्क और कल्पना पर ज़ोर डालें।

तार्किक निष्पत्तियाँ

तर्क : कारण - 1

हम जानते हैं कि...

माध्यमिक परिणाम - 1 [m_1]

तर्क : कारण - 2

हम जानते हैं कि...

चूँकि, क्योंकि, के लिए

माध्यमिक परिणाम - 2 [m_2]

....

....

इसलिए... अंतिम परिणाम = उत्तर! [m_1]

[अर्थात् पहले कारण... फिर परिणाम तक पहुँचने वाला चरण]

$m = m_1 + m_2 + ... m_2$

[प्रत्येक चरण के लिए m_q अंक]

= सवाल के लिए कुल अंक

इससे मूल्यांकन की कार्यविधि में पारदर्शिता भी आती है। विद्यार्थी और मूल्यांकनकर्ता, दोनों को यह पता होता है कि अंक कैसे दिए जाते हैं।

अगर आप पहली बार में "समझ नहीं पाते" हैं, तो इसे अभी छोड़ दें।

इसके बारे में सोचते रहें और फिर इस पर वापस आएँ।

टेक्स्ट में हल किए गए सवालों में इस्तेमाल किये गए चरणों/तर्कों की फिर से जाँच करें।

फिर कोशिश करें !

चरण : 5.

अगर अंत में आप इसे खुद से हल कर लेते हैं, तो बहुत अच्छा महसूस होता है ना?

कठिन बिंदुओं पर दोस्तों या परिवार के किसी सदस्य से चर्चा करके सवाल को हल करना भी एक अच्छा प्रयास है क्योंकि इससे इतना तो पता चलता है कि आपने

उसमें शामिल तर्क को समझ लिया है।

(गणित में सफलता की खुशी महसूस करें!)

ऐसा लग सकता है कि आपको हरेक सवाल के लिए हरेक चरण पर बार-बार कारणों को लिखना पड़ता है। पाठक (आपके काम के मूल्यांकनकर्ता) के सामने यह साबित करने के लिए यह ज़रूरी है कि आप जानते हैं कि वास्तव में सवाल को कैसे हल करना है! इससे सीखने वाले को परिणामों को अच्छे से जानने में भी मदद मिलेगी और वे नए सवालों को आत्मविश्वास के साथ ज़्यादा तेज़ी से हल कर सकेंगे। इसके अलावा, नोट करें: (1) आपके पाठ्यक्रम के बाहर कोई सवाल नहीं। (2) गणित के अध्ययन के प्रति कोई शॉर्टकट या इधर-उधर कुछ छोड़कर छलाँग मारने का दृष्टिकोण नहीं होना चाहिए। (3) प्रस्तुत किये गए क्रम में अध्ययन करें। (4) टेक्स्ट में दिए गए सभी सवालों को हल करें। केवल तभी आप गणित में आत्मविश्वास पा सकेंगे। आज किया जाने वाला कठिन परिश्रम आपके भविष्य के जीवन के कई क्षेत्रों में आपकी योग्यता को

बढ़ाएगा।

यहाँ क्या चर्चा की जा रही है इसका अनुभव करने के लिए, नीचे दिए गए उदाहरण के साथ प्रयास करें और खुद अपनी स्थिति की जाँच करें!

खुद जाँच करने के लिए कुछ अभ्यास :

(CAP) प्रश्न 1 से 7 के लिए आपको जो पिछली पृष्ठभूमि जाानी चाहिए वह है संख्या सिद्धांत के मूल तत्व। 8 के लिए बुनियादी बीजगणित। 9 से 11 के लिए ज्यामिति के मूल तत्व और 12 के लिए आधारभूत कैलक्यूलस + सीमाओं की अवधारणा, अवकलन आदि की ज़रूरत होती है।

10 + 2 स्तर पर हर विद्यार्थी को यह जानना चाहिए

i. ~ 180 - प्रमेय / ज्यामिति में उपप्रमेय।
ii. ~ 60 - गुणधर्म / संख्या सिद्धांत और बीजगणित की अवधारणाएँ।
iii. ~ 72 - समाकलन / अवकलन / त्रिकोणमिति के फ़ॉर्मूले।

अपने खुद के नोट्स बनाने और संग्रह करने की कोशिश करें - गणित मार्गदर्शिका।

हरेक विद्यार्थी "उन्हें पहली नजर में पहचानने", लागू करने और सवालों को हल करने के योग्य होना चाहिए।

खुद जाँच करने के लिए कुछ अभ्यास

Sl. No.	सवाल	जवाब पहली नजर में?
1.	$7 > 3$	सही/गलत
2.	$\frac{1}{7} > \frac{1}{3}$	सही/गलत
3.	$\frac{1}{7} + \frac{1}{3}$	गणना करें
4.	"1" एक अभाज्य संख्या	सही/गलत
5.	"0" एक प्राकृतिक संख्या	सही/गलत
6.	LCM x HCF = ?	संख्याओं के युग्म के लिए
7.	$\frac{0}{a}$ =? और $\frac{a}{0}$ =?	
8.	$ax^2 + bx + c = 0$	मूल ज्ञात करें
9.	एक समकोण त्रिभुज में एक कोण 30 है,	दूसरा कोण?
10.	क्षेत्रफल = लम्बाई X चौराई	आकृति?
11.	क्षेत्रफल = ½ आधार X ऊंचाई	आकृति?
12.	$\frac{d}{dx}(x^2) = 2x$	कैसे?

ऐसे अनेक उदाहरण दिए जा सकते हैं।

विद्यार्थियों की सफलता पर केंद्रित पाठ्यपुस्तक

गणित सिखाने/सीखने में इस कार्यनीति को लागू करने के लिए पाठ्यपुस्तकों की छपाई के एक नए प्रारूप की ज़रूरत होगी। मैं इस प्रारूप को कहता हूँ - "विद्यार्थियों की सफलता पर केंद्रित टेक्स्टबुक प्रारूप"। नए प्रारूप में 4 कॉलम होंगे, जिनमें :

i. एक 9 सेमी चौड़े कॉलम में मूल टेक्स्ट, उपसर्ग-[पिछली जानकारी] और प्रत्यय (पूछताछ कॉलम) के साथ। यह आँखों में तनाव और सर हिलाए बिना समझने के साथ एकाग्रतापूर्वक पढ़ने को सुविधाजनक बनाएगा।

ii. एक 3 सेमी चौड़े बाएँ / उपसर्ग कॉलम की जगह, "पिछली पृष्टभूमि की जानकारी इंगित" करने के लिए।

iii. एक 3 सेमी चौड़े दाएँ / प्रत्यय कॉलम की जगह, "सम्बन्धित मुद्दों, अनुप्रयोग का क्षेत्र इंगित" करने के लिए, या इसमें चर्चा किये जा रहे मूल विषय से सम्बन्धित बहुविकल्पी प्रश्न भी लिखा जा सकता है।

iv. हरेक पृष्ठ के नीचे लगभग 5 सेमी ऊँचाई और पूरे पेज की चौड़ाई [3+9+3] सेमी का फुट-नोट कॉलम / फुट-नोट के लिए जगह तथ्यों को पुष्ट करने के लिए।

इससे पाठ्यपुस्तक प्रकाशित करने में किसी अतिरिक्त खर्च की ज़रूरत नहीं होगी, मगर विद्यार्थियों के लिए

पाठ्यपुस्तक लिखने वालों को और अधिक मेहनत करनी होगी। [ताकि हर पृष्ठ पर एक अच्छा शिक्षक उभर आए!]

संसाधन

निष्कर्ष के रूप में, मुझे लगता है कि गणित के अध्ययन को करोड़ों लोगों के लिए आसान बनाया जा सकता है और किसी तरह के भय की कोई ज़रूरत नहीं है।

कृपया याद रखें कि एकेडेमिक्स में घनिष्ठता आत्मविश्वास को जन्म देती है !

Mental	मानसिक
Ability	योग्यता
Hack	टुकड़े करना / बांटना
Equations	समीकरण
Multiplication	गुणन, गुणा
Addition	जमा, / जोड़
Inverses	प्रतिलोम / विपरीत
Correctly	सही / ठीक
Sequentially	अनुवर्त्ती / आनुक्रमिक

Complete work on time !

Frame *# 19*

EVERY ACTIVITY HAS EXPIRY DATE/TIME. COMPLETE THE TASK 'WITH-IN' THAT PERIOD

In school

- 1 period is 30-45 min.
- 1 Exam is 2 to 3 hours.
- 1 Semester 4 months.
- 1 Academic year

Follow at home

- 40 min. a day walk
- 6-8 hours sleep a day
- Get up 6/5.30/5/4.30/4 am from Std. 3/5/7/9/10
- 8.30/9 pm to sleep
- Recreaction 30 min/day!
- NO Mobile / TV max 8 min. ! [In a day]
- A topic Read 10 min. ... 30 min write.

Remember:
Self discipline/Time management is the key to your SUCCESS.

BSS-294, 24/12/2018

PART-5:
VISIONARY ....
IDEAS FOR STANDARDISATION SCHOOL EDUCATION

After having solved the Maths riddle it is much more easier to apprciate solutions to non maths questions.

4.1 Cultivate a Complete Answer Writing Habit

For this I suggest simple accronym - NEED - IPS way.

In the broadest sense,

- Writing an answer is like filling up a blank page! In such a way that the reader....
- Evaluator (of your answer script) is able to understand your writing and feel that you know the subject

You may follow the **'NEED IPS'** procedure to write a complete answer.

[B.S.Sudhindra, 1995]

This involves following steps:

STEP -1: Noting down essential points.

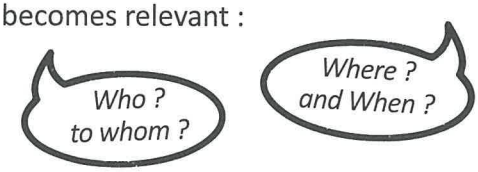
Essential points are those that lead to answer the following question:

In science/Engg problems solving:

And

Units: kg, gm km/hr cm/sec SIGN ? + / - vectors	Advantages / PLUS points & Disadvantages / Limitations	A simple diagram/ sketch, if possible/ relevant. Use 2 or 3 colors high-lights

In history, literature etc writings the following points becomes relevant :



STEP-2: Elaborating each point into a small paragraph. *{1 to 10 sentences}.*

STEP-3: Edit the paragraph into a sequential order.

1. by giving an Introduction to the theme
2. then placing the Paragraphs in order
3. giving a brief Summary

STEP -4: [Optional]

In practicing days, you may use a dictionary and Roget's Thesaurus to improve your write-up.

It takes some time and practice to get used to this way of answering. If done sincerely, you are bound to score very high marks.

Ex. Starting from 1) your birthday, 2) Independence day, 3) A visit to a zoo or park or a new place and hosts of academic questions.

4.2. Facing 'any-type' Exams /Questions Successfully !

This requires one to think applying **'REVERSE LOGIC'**.

Case-1 :- Tackling exams with reverse logic

Before start of exams, the biggest fear for students is that of the likely questions to be asked. After exams, they fear the results.

No matter which end of the learning spectrum one wishes to address, the answer lies in understanding what maximum can be asked, after all, on any topic? Let's try **'REVERSE-LOGIC'**.

Every human being has logical thinking software builtin at birth. We need to only USE IT, practice it and perfect it in applying to cases.

Consider any topic, say Newton's third law. The law states that 'action and reaction are equal' and opposite 'THINK FIRST' of the words used viz action, reaction, equal and opposite. Here action/reaction implies some kind of FORCE being applied. Looking further, we need to know the concept, meaning and usage of words: 'FORCE' and its mathematical formula **"F = Mass x Acceleration"**.

Next, the meaning and formula of ACCELERATION. Accn = rate of change/motion in a particular direction. Again Words equal & opposite should tell us that DIRECTION of motion is assuming significance. Forward or backward, left or right, upward or downward, circular or COMPONENT in x-axis and yaxis etc. If in one direction acceleration is 'positive', the same in 'reverse direction' has 'NEGATIVE' sign.

All quantities are in some units. Mks/British system. One has to be extremely careful about ALL IN the SAME scales cm, or meters or kilometers, mass in gm/kG etc. and

Direction of force i.e. Signs must always be included while calculating (remember is it + or - ?). When all the terms, formulas and how to use

where or calculate BECOMES FAMILIAR to a student, then automatically one gets the confidence of knowing the given topic.

Now to deal with "What can be asked in exam?" For the above example, the question can be written down in any of the following ways:
State Newton's third law. Straight and simple or Write short note on third law of Newton's law of motion.

We hear and read news about collisions of a car/ truck/bus etc The extent of damage is directly an application of third law. Calculate a car travelling at 60km/hr to come to stop, how much time and distance between cars be there to avoid collision? Many variants of daily experience can be cited and you are asked to explain/write an answer.

ONCE YOU THINK and start PRACTICING 'Reverselogic' procedure to understand any topic of your syllabus, facing any EXAM becomes easier, You would gain more confidence. Teachers should try to inculcate this line of thinking/analysis FROM THE BEGINNING of an academic year and follow through out the year.

Initially it takes much time to get "tuned" to studies, but academic success comes only through a selfdisciplined and sustained effort through-out the year. One can sail through (no need to protest) any evaluation system !

Frame
 # 20

Towards streamlining School Education system ..... a Model

Dr. B.S. Sudhindra suggests: {Streamlining School Edu. ... More digestible, Enjoyable.}

24 CREDITS/SEMESTER (2 SEM/YR)

1 credit = Theory 1 period of 30 to 50 min.;
Practical (1:30 min to 3:00 hours periods per week, for 16 weeks in a Semester

- Maths 8 credits
  English 4 credits
  EVS 4 credits
  Language-1 2 credits
  Language-2 2 credits
  Social Studies 2 credits
  SUPW etc. 2 credits
- Academic Activity Only
- [Use Folk-Cap, NEED-IPS, Rule of Three, Reverse Logic, in writing answers / problem solving!....]
- Use Time: 4 am - 7 am study ! Every day!
- Extra Curricular Activity. It's EXTRA. PT/YOGA/anything Functions !
- 16 weeks only! If a holiday Mon - Fri. compensate work on Saturday/Sunday.
- Re-format Text Books to Student's Success Centered way. [4 column, 9 cm Main one.]
- It's your life.... Make it a glorious one! In your hands.
- http://asiapacificodl2.oum.edu.my/C23/F269.doc

BSS-15, 16/08/2015. Updated: April, 2019

4.3 Credit System in School Education

There is a huge demand to have a standard school Education system for the country. In this context I suggest that Credit System in School be introduced. The details have been submitted to NCERT, NEP 2016 group. However, till today no formal announcement have been made on the New Education Policy. Albite some crucial changes are been been introduced by CBSC frequently/recently like to have a basic group in Maths Lighter version and regular version.

- INTRODUCE Semester system right from Std 1 to Std 12 with 24 CREDITS per Semester.!
- Theory One credit being One period [40 minutes] per week for 16 weeks in a semester.
- Practicals / Lab / Activity One Credit is one session of 3 x 40 = 120 mins = two hrs per week for 16 weeks in a semester.
- In order to solve the problem of 'weak in Maths.' Maths should be taught at 8 credits per semester ALL Through Schooling Years! Use FOLK-CAP Way for Problem Solving!
- Since 'Learning' is SLOW process and a STEADY time table with LEAST holidays on Mon-Fri be ensured. In case an holiday comes on Monday to Friday, the immediate Sat/Sunday should be WORKING day to compensate the holiday!

The age old saying **'Slow and Steady Wins the Race'** here its Academic Success.

- All current problems like a 5th std student can not read a 2nd text or 8th std students finds difficulty in 3 digit multiplication/Division etc VANISHES due to more hours in class put-in schools as required in a true Semester system.
- Transition for students from School to College will be much smoother in view of familiarity of Semester setup.
- This Two Semesters in a Year will ease burden of books 'literally by HALF'.
- Exams pressure also eases as ONLY a semester content will be involved in a year [not whole year matter].
- I have been advocating the NEED to RE-FORMAT Text books [can be done at NO Extra Cost! I can help in this effort] so that EVERY Student is made aware of 6RL 'Elements of Edu' popping up in EVERY PAGE of book. This effort will be like having the benefit of a Good Teacher available to Every Student!
- Even Parents and so called 'UN-trained' Teachers also feels comfortable to help the student more effectively!
- WE MUST FACILITATE every student can ENJOY and be SUCCESSFUL in Learning and able to Answer ANY Question correctly ***from his own efforts*** Using **FOLK CAP**, NEED IPS, RULE of Three, Reverse Logic!

- Please IMPLEMENT the system in Public Interest! BEST WISHES.

[BSS, 16-Aug - 2015]

Update Note. I had sent this suggestion to Sri T. S. R. Subramanian then Chairman for Revision of NEP15. Again told at a Meeting with Principal Sec, School Edu. Karnataka on 9th October, 2018.

The above information is also been shared with NCERT faculties at New Delhi.

As the New Edu Policy as of now[March 2019] is not published, I have given the above for info of Parents,Teachers and others who may like to see this way implemented in NxtGen's interest. [by Public pressure].

4.4 Learner's Success Centre Textbook Writing

The present work follows the format of Learner's Success Textbook Writing format of 4 coloumn a page way.

The primary aim is to facilitate focussed reading with understanding of the contents.

It is suggested not to cramp information to reduce cost of printing. Afterall our aim is every student no matter where he is located (urban/rural/remote etc.) should get the same exposure.

How to have a good teachers effects in every Textbook Page ...

Frame # 21

Dr. B.S. Sudhindra's

LEARNER'S SUCCESS CENTERED TEXTBOOKS

Page Layout : Format

3 cm wide col.	9 cm width column	3 cm wide col.
	Main text (Current topic)	
Previous Information	Basis: Easy to read full text without eye/head movement !	**Tips:** Where used applied Reference See..... MCQs
Background Can be empty as well	**(Facilitates Focused Reading)**	Can be empty as well No cramping of Information

Foot note:
Number each new word, theorem, principle, logic etc. for easy cross referencing. Place here related questions and answer to MCQ of this page.

[Use it to re-enforce aspects]

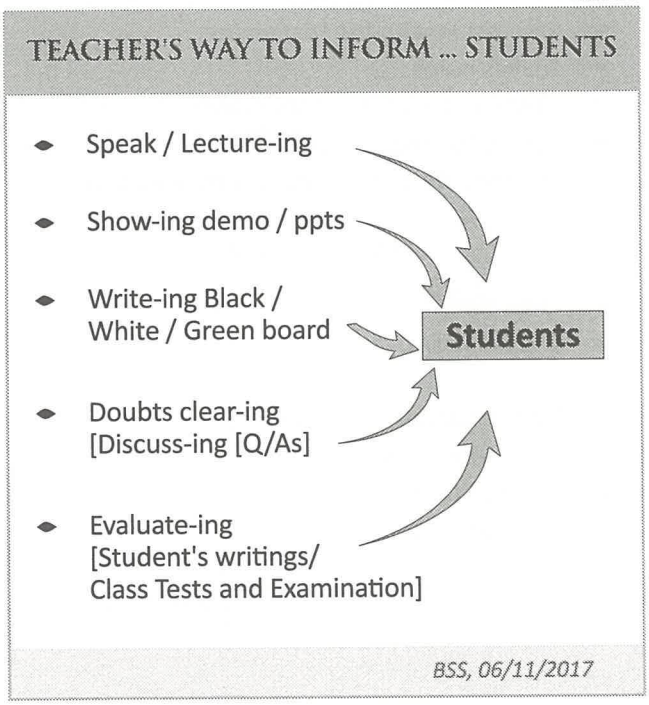
BSS-3; 24/10/2002

4.5 Duties of Teachers and Students are different

Often we find a blame game going between the two by administration or parents especially AFTER anouncement of results. The following boxes clearly shows the difference.

Teachers way.....

Frame #22



Students Study.....

Frame # 23

STUDENTS STUDY ..., TEACHER EVALUATES ...

Student Collects Information

- Listening Lectures
- Reading Textbook
- Refer other books/Web
- Discussion with friends/seniors
- Makes notes ....
- Ready to face class tests/exams
- Scores depends on Self-efforts !

Therefore, '5RL Skills' are DUTY of Every Student!

Teachers' Role

- Class Tests
- Examinations

- TWO clear demarcations
- Non-overlapping Roles !
- No Credits Sharing !
- Each plays different roles

BSS, 06/11/2017.

To Strengthen students to face 21st century problems, it is necessary to **REVAMP question paper** models as well.

1) Introduce negative marking in MCQ cases.

2) Have only 4, 6 or 8 marks questions involving many steps to final answer.

All real situation problems involve multi steps and not like 1 mark or 2 mark question type.

Eureka..... on Maths 1

Frame #24

HOW TO CREATE MATHS LITERATE SOCIETY ?

- ***Jewish example !***
  In Israel, pregnant women always carry maths books !!!

  She would always try to solve mathematical problems with her husband!

  'YES to train the child still in the womb so that it would be a genius later on'.

  She would solve maths problems without let-up until the child is born! Thereby feeding the baby's brain during pregnancy adds up to
  1 full year of schooling. ..... helps the child's cognitive abilities at 9 to 12 years of age.

  Nutritional Supplements are also taken like eating almonds and dates with milk, take cod liver oil!

  ... children know Hebrew, Arabic and English ...Play Piano and violin.

Source: 1) *http://www.newindianexpress.com/thesundaystandard/2017/jan/21/feed-your-babysbrain-during-pregnancy-1562151.html*

Source:2) *Why are Jews so Smart by Dr. Stephen Carr Leon [Source: Dec 2016... whatsapp]*

- ***American example!***
  See also the book 'How to teach your baby maths!' by Glenn Doman and Janet Doman.
  [ISBN: 978-0-7570-0184-0]

- ***Indian Scenario!***
  We NEED to change our daily habits of eating and parenting. May be within 3 generations it could be achieved!
  Young Couples need to give a try!

BSS-14, 22/01/2017. 11.01 pm

केन्द्रीय माध्यमिक शिक्षा बोर्ड
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Certificate of Participation

इसे प्रमाणित किये जाता है कि डॉ/सुश्री/श्री डॉ बी.एस.सुधींद्र
सेवानिवृत्त, ओएसडी और डायरेक्टर इग्नु, बंगलौर ने दिनांक ४ जून २०१९ से
६ जून २०१९ तक दिल्ली पब्लिक स्कूल, बंगलौर नॉर्थ, बंगलौर में 'कृत्रिम बुद्धिमत्ता' पर आयोजित तीन दिवसीय प्रशिक्षण कार्यक्रम में भाग लिया।

This is to certify that Dr./Ms./Mr. DR.B.S.SUDHINDRA
from FORMERLY, OSD & DIRECTOR IGNOU, BANGALORE
attended a three days **'Training Programme on Artificial Intelligence'** organised by CBSE in association with Intel from 4th June, 2019 to 6th June, 2019 at Delhi Public School, Bangalore North, Bangalore.

निदेशक, कॉर्पोरेट अफेयर्स, इंटेल इंडिया
Director, Corporate Affairs, Intel India

निदेशक (प्रशिक्षण एवं कौशल शिक्षा), के.मा.शि.बो.
Director (Training & Skill Education), CBSE

EST: 1960

IT for Change

Certificate of Completion of Course

This is to certify that Ms. / Mr. Dr. B.S. Sudhindra
has successfully completed the program
ICT integration in teaching - learning
conducted by Vijaya Teachers College and IT for Change,
from 1/4/19 to 5/4/19

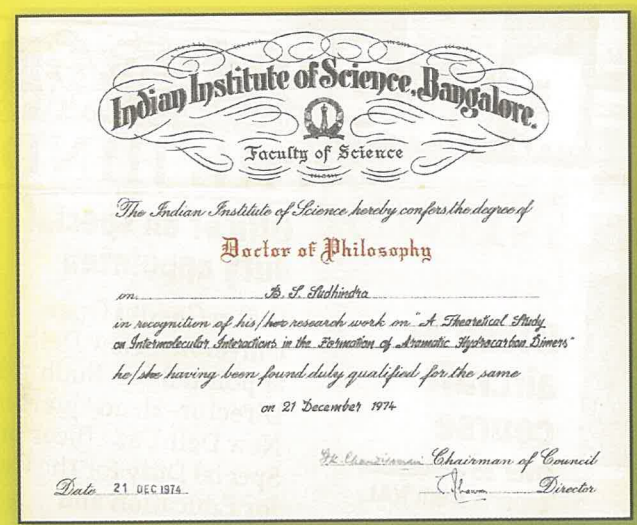
PRINCIPAL
Vijaya Teachers College, Bengaluru

DIRECTOR
IT for Change, Bengaluru

Date: 4/4/19

ATTENTION NXT GEN!

The purpose of sharing the above certificates is to highlight the importance of everyone/you need to get oneself/yourself constantly updated all through your life. I have done my part above, just before publishing this FOLK-CAP Book.



Indian Institute of Science, Bangalore.

Faculty of Science

The Indian Institute of Science hereby confers the degree of

Doctor of Philosophy

on B. S. Sudhindra

in recognition of his/her research work on "A Theoretical Study on Intermolecular Interactions in the Formation of Aromatic Hydrocarbon Dimers"

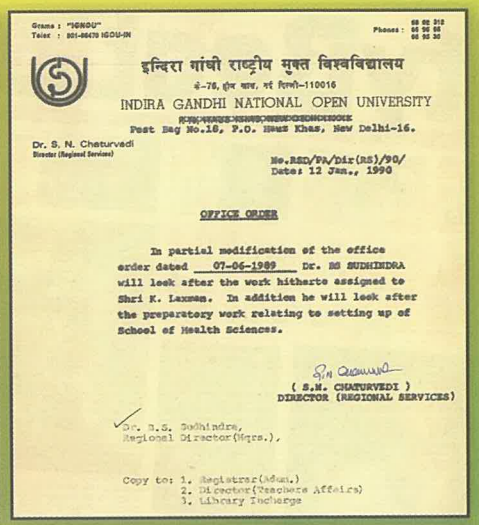
he/she having been found duly qualified for the same

on 21 December 1974

Chairman of Council

Director

Date 21 DEC 1974



Grams : "IGNOU" Telex : 031-66470 IGOU-IN

Phones : 66 82 312 66 96 66 66 95 30

इन्दिरा गांधी राष्ट्रीय मुक्त विश्वविद्यालय

ई-76, इंदिरा गांधी, नई दिल्ली-110016

INDIRA GANDHI NATIONAL OPEN UNIVERSITY

Post Bag No.16, P.O. Hauz Khas, New Delhi-16.

Dr. S. N. Chaturvedi
Director (Regional Services)

No.RSD/PA/Dir(RS)/90/
Date: 12 Jan., 1990

OFFICE ORDER

In partial modification of the office order dated 07-06-1989 Dr. BS SUDHINDRA will look after the work hitherto assigned to Shri K. Laxman. In addition he will look after the preparatory work relating to setting up of School of Health Sciences.

(S.N. CHATURVEDI)
DIRECTOR (REGIONAL SERVICES)

Dr. B.S. Sudhindra,
Regional Director(Hqrs.),

Copy to: 1. Registrar(Admn.)
2. Director(Teachers Affairs)
3. Library Incharge

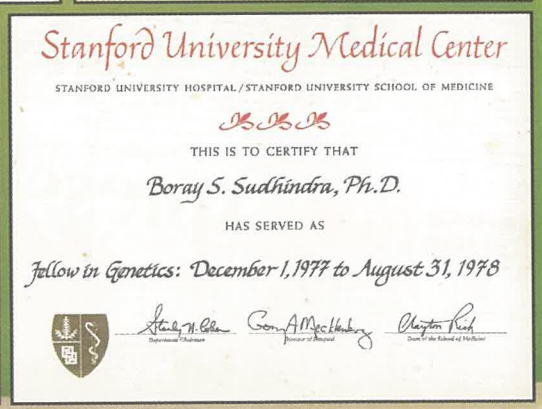
Alexander von Humboldt-Stiftung

Herr
Dr. Boray Subbarao Sudhindra
Indien

erhielt vom 1. September 1979 bis 30. Juni 1981
ein Forschungsstipendium
der ALEXANDER VON HUMBOLDT-STIFTUNG
in der Bundesrepublik Deutschland.
Er führte in dieser Zeit wissenschaftliche
Untersuchungen durch
am Institut für Organische Chemie
der Freien Universität Berlin

Bonn-Bad Godesberg, im Jahre 1981

Der Präsident



Stanford University Medical Center

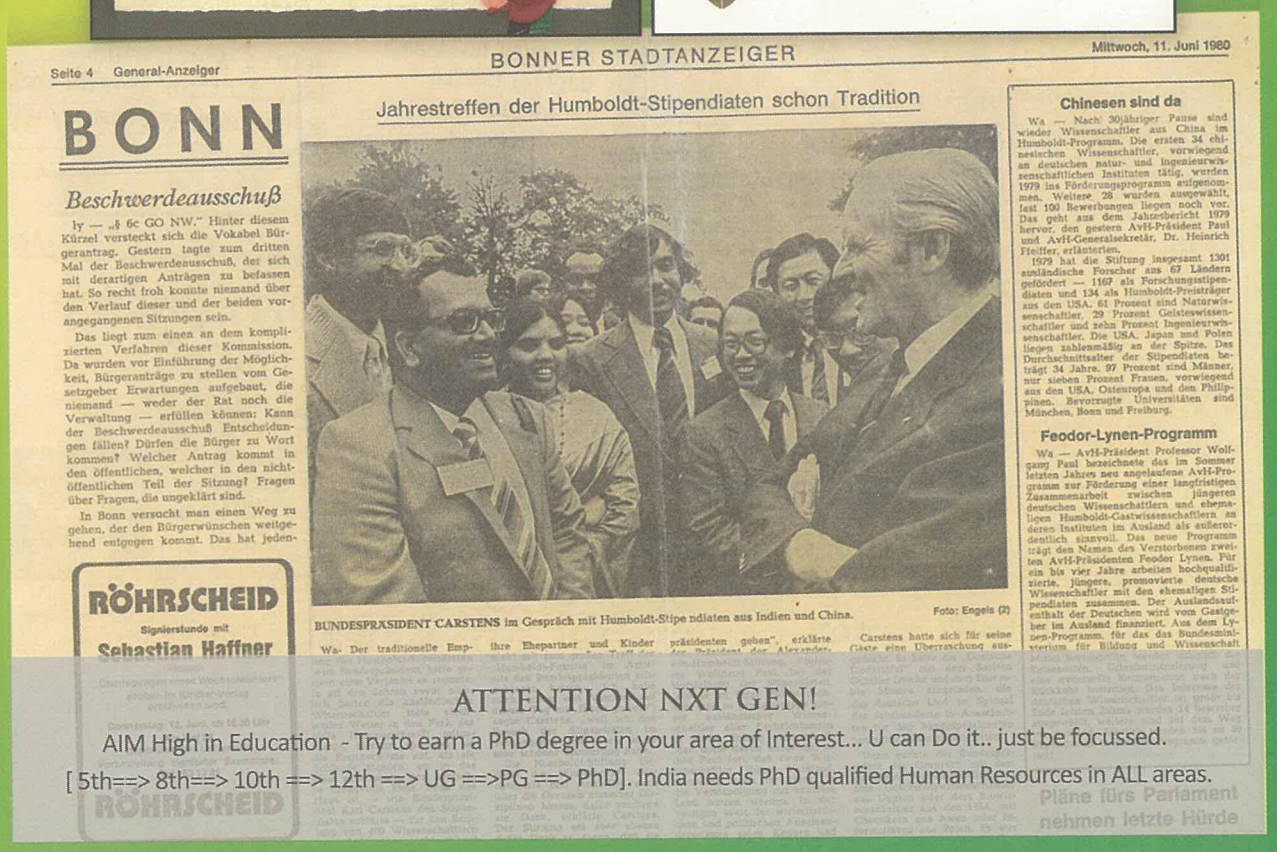
STANFORD UNIVERSITY HOSPITAL / STANFORD UNIVERSITY SCHOOL OF MEDICINE

THIS IS TO CERTIFY THAT

Boray S. Sudhindra, Ph.D.

HAS SERVED AS

Fellow in Genetics: December 1, 1977 to August 31, 1978



Seite 4 General-Anzeiger

BONNER STADTANZEIGER

Mittwoch, 11. Juni 1980

BONN

Beschwerdeausschuß

ly — „§ 6c GO NW." Hinter diesem Kürzel versteckt sich die Vokabel Bürgerantrag. Gestern tagte zum dritten Mal der Beschwerdeausschuß, der sich mit derartigen Anträgen zu befassen hat. So recht froh konnte niemand über den Verlauf dieser und der beiden vorangegangenen Sitzungen sein.

Das liegt zum einen an dem komplizierten Verfahren dieser Kommission. Da wurden vor Einführung der Möglichkeit, Bürgeranträge zu stellen vom Gesetzgeber Erwartungen aufgebaut, die niemand — weder der Rat noch die Verwaltung — erfüllen können: Kann der Beschwerdeausschuß Entscheidungen fällen? Dürfen die Bürger zu Wort kommen? Welcher Antrag kommt in den öffentlichen, welcher in den nichtöffentlichen Teil der Sitzung? Fragen über Fragen, die ungeklärt sind.

In Bonn versucht man einen Weg zu gehen, der den Bürgerwünschen weitgehend entgegen kommt. Das hat jeden-

Jahrestreffen der Humboldt-Stipendiaten schon Tradition

BUNDESPRÄSIDENT CARSTENS im Gespräch mit Humboldt-Stipendiaten aus Indien und China. Foto: Engels (2)

Wa- Der traditionelle Emp- ihre Ehepartner und Kinder präsidenten geben", erklärte Carstens hatte sich für seine Gäste eine Überraschung aus-

Chinesen sind da

Wa — Nach 30jähriger Pause sind wieder Wissenschaftler aus China im Humboldt-Programm. Die ersten 34 chinesischen Wissenschaftler, vorwiegend an deutschen natur- und ingenieurwissenschaftlichen Instituten tätig, wurden 1979 ins Förderungsprogramm aufgenommen. Weitere 28 wurden ausgewählt, fast 100 Bewerbungen liegen noch vor. Das geht aus dem Jahresbericht 1979 hervor, den gestern AvH-Präsident Paul und AvH-Generalsekretär, Dr. Heinrich Pfeiffer, erläuterten.

1979 hat die Stiftung insgesamt 1391 ausländische Forscher aus 67 Ländern gefördert — 1167 als Forschungsstipendiaten und 134 als Humboldt-Preisträger aus den USA. 61 Prozent sind Naturwissenschaftler, 29 Prozent Geisteswissenschaftler und zehn Prozent Ingenieurwissenschaftler. Die USA, Japan und Polen liegen zahlenmäßig an der Spitze. Das Durchschnittsalter der Stipendiaten beträgt 34 Jahre. 97 Prozent sind Männer, nur sieben Prozent Frauen, vorwiegend aus den USA, Osteuropa und den Philippinen. Bevorzugte Universitäten sind München, Bonn und Freiburg.

Feodor-Lynen-Programm

Wa — AvH-Präsident Professor Wolfgang Paul bezeichnete das im Sommer letzten Jahres neu angelaufene AvH-Programm zur Förderung einer langfristigen Zusammenarbeit zwischen jüngeren deutschen Wissenschaftlern und ehemaligen Humboldt-Gastwissenschaftlern an deren Instituten im Ausland als außerordentlich sinnvoll. Das neue Programm trägt den Namen des Verstorbenen zweiten AvH-Präsidenten Feodor Lynen. Für ein bis vier Jahre arbeiten hochqualifizierte, jüngere, promovierte deutsche Wissenschaftler mit den ehemaligen Stipendiaten zusammen. Der Auslandsaufenthalt der Deutschen wird vom Gastgeber im Ausland finanziert. Aus dem Lynen-Programm, für das das Bundesministerium für Bildung und Wissenschaft

Pläne fürs Parlament nehmen letzte Hürde

CityBeat

Pune's Only Weekly

Vol. 1 Issue No.13 Pune, Sunday, 18th July To 24th July, 1999 Price Rs 3.00 16

5 Polls in Puna ...

7 Rigors Of The Road

8 Damsel de jour

12 Formula One: Here We Come!

15 Kuchcha Kabab

"The System Did Not Support Me"

Exactly nine years after his findings, a British organisation has claimed that 'over-the-counter painkillers may be a key ingredient of a new cocktail of drugs to cure lung cancer'

Could this man have been a noble laureate ? Dr Sudhindra changed tracks from being a scientist to being an educationist to serve the nation.

By Samvit Rawal

The bureaucratic head has marred the careers of many brilliant Indians. Dr Heraj Subbaraya Sudhindra could have easily been one of the...

...search (ICMR), he came across a major find, and submitted a proposal for the development of an anti-cancer drug. He was shooed away because his boss wanted his son-in law to be in his post.

"I predicted through my knowledge of chemistry that Ibuprofen, a widely used analgesic and anti-inflammatory drug, could be a lead molecule in the design of anti-cancer drugs," said Dr Sudhindra in an exclusive interview with CityBeat.

"The technical publications had accepted my models. An American company even wanted to establish a collaboration, but vested interests in the ICMR did not allow me any funds, nor did they give me any support. They even did not allow me to continue my research there," he said.

Now, exactly nine years after...

...his findings, a British organisation has claimed that over-the-counter painkillers may be a key ingredient of a new cocktail of drugs to cure lung cancer' widely acknowledging.

"I even after my findings put forth my theory and then findings while I had said th whole body," said

"In 1987 there give me a position search in this area

Indian soldiers hoist the national flag and shout slogans on Point 4875 in the Drass sector of Kashmir. The point was captured from Pakistani backed infiltrators after a major fight.

A Rotrophy supplement with The New Indian Express

Friday, APRIL 20, 2007

Education Express

Study abroad
M Tech in France
P2

CEO corner
Devita Saraf
P3

Science &You
High speed trains
P4

The joy of Mathematics

...educationist suggests a ...thod to make mathematics ...e fun and easy. He calls it the Folk-Cap way...

...OULD maths be made ...mpulsory or optional ...fter Class VIII? This is ...n ongoing debate in ...academic circles. But, we ...

The Folk-cap procedure involves these steps:
Step 1: Be aware of previous chapters/maths data (vocabulary and script) such as definitions, theorems and properties of ...

TUESDAY MAY 9, 2006 | EDUCATION TIM...

(i) Solve all problems given in the text. Only then will you have gained confidence in Maths. The hard work done now, multiplies your ability in many spheres of your life later on.

To get a feel of what is being discussed try the example given below and self check your position!

Some Facilitating Self Check Exercises:

Question : Answer at first sight!

1.1 > ... TRUE / FALSE

The backgro... student requires ... questions are of ... theory for quest... Algebra for the ... Elements of Geo... and the twelfth ... basic calculus + ... differentials are...

At 10 + 2 level need to be aware (i) 180 theorems ... geometry. (ii) 40 properti... number the (iii) 72 integral ...

ENJOY MATH MATCH BEST MINDS ...

Math's for everyone. If it is seen in the right light, you ca... enjoy it, writes Prof B S Sudhindra

CURRENTLY there is a great debate on whether maths subject to be made compulsory or optional after 8th standard. As a Nation we need a Math literate Society. My feeling is the Joy of Math problem solving can be easily CULTIVATED by one and all - here's a way to look at.

Learning is a slow process. It does demand you to spend time and efforts to understand any topic. Mathematics ... words and phrases, one needs to know at beginning of 5th standard 112 words only. As student goes through each standard adds an additional 62, 94,76, 64 (up to 8th end total 408 words only) and 117 & 119 new words and phrases in IX and X adding to total of about 650 words only! [Sudhindra, 2003]. This number is not too large as compared to number of words that a student must get familiar... every step for every problem. This is necessary to prove the results (evaluate if you know it work) that you know how exactly to solve the problem. It will also help the learner master the important results and speeds up his/her ability to tackle newer problems confidently. Further, Note: No problem outside your syllabus (2) No short cuts or skip and jump approach to study maths. (3) Study in sequence presented. (4) Sp...

DNA

DAILY NEWS & ANALYSIS

THE HINDU

NEWS BRIEFLY

BTech in aircraft course

Over 35 aerospace experts from NAL, ADE, HAL, IISc, DRDO, and others participated in design and development of a new graduate course, BTech in Aircraft Technology and Maintenance, which is scheduled to be launched soon. IGNOU has appointed BS Sudhindra, director, New Delhi, as officer on special duty for Centre for Education and Research, in aircraft maintenance for the regiona... centre in Bangalore.

Officer on special duty appointed

Indira Gandhi Open University, New Delhi, has appointed B.S. Sudhindra, Director–Head Quarters, New Delhi, as officer on Special Duty for the Centre for Education and Research in Aircraft Maintenance and Systems for the Bangalore Regional Centre.

According to a release, over 35 aerospace experts from NAL, ADA, HAL, IISc., DRDO and AeSI have participated in the design and development of B. Tech in the Aircraft Technology and Maintenance graduate course, which will be launched this month. emai... to ignouceramsblr@gmail.com

HYDERABAD

THE HINDU • MONDAY, MAY 29, 2006

2 EDUCATIONPLUS

Having a problem with maths? Here's help

The number of students failing in engineering mathematics is on the rise, according to reports. This seems to be a universal problem. A similar trend is seen in the mechanics paper too. But a much needed alternative look on logical problem-solving is available at UNESCO Knowledge Base on Open and Distance Learning resource (http://asiapacific-odl.oum.edu.my), says B.S. Sudhindra, Regional Director, IGNOU Regional Centre, Pune-411 ... One has to click on ODL...

FIGURE IT OUT: *A maths class is on.* – PHOTO: R. RAGU

Out the Logic with Knowledge of ...

DH Education 14-04-2005

We reproduce below three of the best responses we received for last month's debate (DH Education dated March 10, 2005) on the relevance of examinations. We thank our readers for the overwhelming response we received to our invitation to participate in the debate.

Tackling exams with reverse logic

Before start of exams, the biggest fear for students is that of the likely questions to be asked. After exams, they fear the results.

No matter which end of the learning spectrum one wishes to address, the answer lies in understanding what maximum can be asked, after all, on any topic? Let's try 'REVERSE-LOGIC'.

Every human being has logical thinking software built-in at birth. We need to only USE IT, practice it and perfect it in applying to cases.

Consider any topic, say Newton's third law. The law states that 'action and reaction are equal and opposite ...

Again Words equal & opposite should tell us that DIRECTION of motion is assuming significance. Forward or back-...

...about collisions of a car/truck/bus etc The extent of damage is directly an application of third law. Calculate a car travelling at 60km/hr to come to stop, how much time and distance between cars be there to avoid collision? Many variants of daily experience can be cited and you are asked to explain/write an answer.

ONCE YOU THINK and start PRACTICING 'Reverse-logic' procedure to understand any topic of your syllabus, facing any EXAM becomes easier, You would gain more confidence. Teachers should try to inculcate this line of thinking/analysis FROM THE BEGINNING of an academic year and follow ...

...nnot always be included while calculating (remember is it + or - ?). When all the terms, formulas and how to use where to calculate BECOMES FA...

I thank the 4th Estate Professionals in cooperating to publish these at No-Extra-Cost, in Public Interest and thus meeting the IGNOU aim of **"Reaching the Un-reached"** and MHRD aim to increase GER efforts!

For NxtGen its a typical Example of Non-intersecting Sets!

email: cityexpressbng@newindianexpress.com

BANGALORE Tuesday, 7 January 2014

CITY EXPRESS

THE NEW INDIAN EXPRESS

The mantra for effective learning, well-designed textbooks

by Aparna Chandra

Bangalore: Can our school textbooks hold the key to better teaching and effective learning? B S Sudhindra vehemently believes so. "A lot lies in how a textbook presents a subject. I am of the firm belief that a well-formatted one can tunnel through the issues of poor teacher training, lack of parental awareness and a confused and disinterested student," he says.

Sudhindra, who was formerly regional director of the Indira Gandhi National Open University or IGNOU in Pune and Bangalore, is backing up his claim with the page layout he has designed and which he says is optimal.

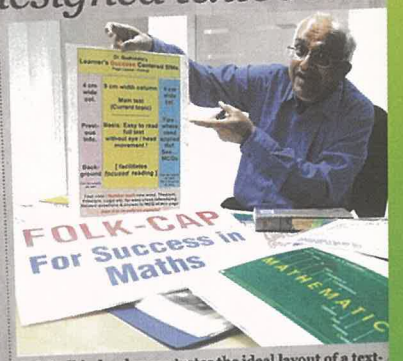
Divided into four sections, the page focusses on a main text area 9 cm wide where matter can be read easily 'without eye or head movement'. Two 4 cm-wide margins on either side make room for notes on associated 'previously taught items' in one and 'reference material' in the other. "The footnote at the bottom will give a list of new words, numbers and such learnt in the lesson on that page," says Sudhindra who undertook a study of state textbooks in use in Maharashtra and Karnataka to devise his format.

"Unfortunately, most textbooks seem to be bent upon loading the student's mind with information without taking into cognisance if it's even digestible. The average textbook uses 65 to 70 characters in one sentence, I suggest 42 to 43 only," he says.

The pursuit towards better textbooks has been a long-standing one for this Jayanagar resident. It all began when he was based in Pune in 1989. "We were told at IGNOU to enroll as many students as we could. But the numbers cannot grow if the students themselves are not qualified to take on higher studies. I found that students of classes 8 to 10 particularly failed in Mathematics and English and that is when I began reviewing textbooks to understand the root of the problem," says Sudhindra.

What he found is that textbooks were given to using dry language, discussing concepts without connecting them to their applications, listing fact after fact without touching upon their utility and using, what he terms, 'tap-water writing'. "It just goes on and on with no readability value," Sudhindra says, adding that simply re-formatting the information as per his layout may go a long way.

A doctorate in molecular medicine from IISc, who was a post-doctoral fellow at Stanford University and a Alexander-von-Humboldt fellow at FU Berlin in the late 1970s, Sudhindra can't help but feel agitated with the quality of school study material today. "I have met with all members of the Karnataka textbook committee and its convenor. I even met with the education minister offering my help with designing layout. But all I get is a 'We'll see'," says Sudhindra throwing up his hands.



B S Sudhindra demonstrates the ideal layout of a textbook which he believes will aid wholesome learning | VINOD KUMAR T

SCIENCE EXPRESS

Window on Science Technology & Medicine

INDIAN EXPRESS, TUESDAY, JANUARY 19, 1988

Are we swallowing the wrong pill?

With both the physician and the patient clamouring for more and more drugs, are we promoting a dangerous 'drug culture'? **Radhakrishna Rao** meets Dr. B.S. Sudhindra who has been conducting innovative research on drug design, to throw light on this phenomenon.

INDIA, which claims to be a scientifically advanced nation ready to step into the 21st century, continues to promote a very dangerous "drug culture", that can't but unwittingly help Western drug multinationals in forcing unwanted, and at times counter-productive, drugs down the throats of millions of gullible Indian patients.

To a large extent, this has been made possible by the medical fraternity's amazing ignorance about the drug designs and its functional aspects. Surprisingly, a number of doctors in India, continue to prescribe formulations considered "unwanted and irrational". What's more any one can walk to a drug shop and get just about any type of antibiotics or pain killers, without any prescription.

The Hathi committee set up in 1975 had come out with a list of 116 essential drugs for India, while the WHO in 1977, had recommended about 200 essential drugs. But, here in India, as many as 40,000 formulations continue to be sold at the cost of unwary patients.

Pouring a glut of unwanted drugs into the market

FOCUS

Even Bangladesh, counted among the poorest and underdeveloped countries, has successfully pruned down the formulations available in the country, to just around 300. Mozambique also has walked in the steps of Bangladesh. Quite recently, Bahrain too slashed down the drug formulations to 1200 brand names, as against 22,200 available in market last year.

According to Dr. Mohan D. Nair, Executive Director of the Southern Petrochemical Industries Corporation (SPIC), "there is very little scope for producing radically new drugs. Most of the research today aims at modifying the already existing products". And to quote another wellknown researcher MacCannell "combination drugs today are the darling of inadequate or lazy physicians or less than ethical pharmaceutical companies."

Consumption of more than one potent drug at a time, can lead to undesirable side effects. With both the physician and patient clamouring for more and more drugs, pharmaceutical firms seem to have a field day in India. It is well established that a drug interaction may result in an unexpected or even unique adverse reactions, resulting from the simultaneous use of more than one drug.

Following facts shed light on the current status of drug research:

* For about of 2/3 of ailments, there are no drugs of choice.

* It takes anything between Us $ 40m-90m to put a new drug into the market.

* Basic R & D and clinical trials spread over a span of 10 years are essential to arrive at a new drug.

* Only one drug may arrive out of nearly 10,000 newly synthesised compounds.

Significantly, the biological activity of a drug is a result of its interaction or binding with constituents in the body – called the receptors. Receptors could be molecules on a cell surface, small molecules like peptides or large molecules like DNAs, enzymes etc. The molecular structure of receptors, for a majority of drugs is unknown. It is this lack of knowledge that constitutes the central problem in drug design and the consequential high costs and delay in the arrival of new drugs in the market.

NOW, an Indian biochemical researcher, Dr. Boray S. Sudhindra, a supernumerary research scientists, working under an Indian Council of Medical Research (ICMR) funded project, at the ICMR Centre for Genetics and Cell Biology, Indian Institute of Science (IISc) Bangalore, has come out with a promising procedure to identify the active site of receptors, which can lead to revolutionary changes in drug designing patterns. A doctorate in Chemistry from the IISc, bespectacled Sudhindra had research stints at Stanford University (USA), Free University (Berlin) on a Humboldt fellowship, and at Max Planck Institute (West Germany), before initiating his project "In quest of Receptors" in 1985.

In a beautiful analogy, Dr. Sudhindra compares the current level of insight into receptors, to that of the description of an elephant by a group of blind persons. In another brilliant analogy, Dr. Sudhindra considers drug-receptor interaction as a clap by hands, where the sound is related to the strength of interaction. "No matter how well you look at one of the hands, you can not say anything about the sound/strength of a clap" quips Dr. Sudhindra, and goes on to add "one should know the intricacies of both the partners, if we have to make any meaningful understanding of drug action."

Dr. B.S. Sudhindra

And to quote Michael Beaven of National Heart, Lung and Blood Institute NHLBI (USA), "the concept of receptors remained a theory for about 50 years. But the critical evidence for their existence has only come in the past few years".

Although receptor as whole far as drug activity is concerned only a portion of it is involved in the binding with a drug. This portion of the receptor is the active site structure. An understanding of the structural features of the active site of a receptor can be expected to help in developing more effective and less toxic drugs. It is this vital zone of the receptors, says Dr. Sudhindra, that his molecular modelling procedure seeks to search out through a self-consistent process.

All that is known is that a majority of drugs bind reversibly (the effect of the drug disappears upon its withdrawal during early stages of treatment) at receptor's sites with weak binding energies. The molecular mechanisms of action of a majority of drugs are not fully understood.

To solve this problem, Dr. Sudhindra started with the promise that all drug-receptor interactions can essentially be treated as an exercise in intermolecular perturbation theory. As the molecule approaches its receptor site, there is some optimal distance at which a weak complex is formed, where there is a net balance between repulsive and attractive forces. Using the quantum mechanical intermolecular perturbation theory, he has developed computer programs that give an estimate of the drug-receptor binding energy for any geometry of the complex.

According to Dr. Sudhindra, smaller molecular units like nucleic acid bases, amino acids, peptides can be employed as models for the active site of a receptor. Further one needs to include only those pairs of atoms that are close to one another in the computation of drug-receptor interaction energy and recommends a cut-off distance, between 4-7 A, depending on the nature of the pair of atoms. This enormously reduces the computational costs and search time.

A feature of the computational exercise based on quantum mechanics – a sound molecular theory – is that it forces one to think of the structural features necessary for the drug and its effector, concurrently and on equal footing. Such an advantage is non-existent in any of the currently followed drug design efforts, says Dr. Sudhindra.

CURRENTLY, the methodology is being applied to arrive at the receptor's features for anti-inflammatory drugs. Competent biomedical experts feel the same can equally be applied to arrive at the receptor features for all drugs.

At Dr. Sudhindra points out, it is a dream of drug designers to come out with ideal drugs – those with none or least side effects. He is quite confident that the molecular modelling approach devised by him can help in the designing of safer and more effective drugs.

Right now, the methodology of drug design involves a series of test compounds with determined bioactivity data known before hand. What's more they use complicated statistics to arrive at a better candidate drug. Even so, they tell nothing about receptor's molecular structural features.

On the other hand, Dr. Sudhindra's innovative approach can help eliminate toxicity and side effects of drug action by characterising, at the molecular level, the disease state and the mechanism of drug resistance. Indeed, Dr. Sudhindra's model projects that an active site structure serving as a therapeutic centre for one drug can as well act as a toxicity centre for another drug. Such a possibility can answer the question whether a given receptor for a drug is the same in the infectious and normal states.

All said and done, it will be sometime before Dr. Sudhindra's molecular modelling approach is perfected for wide acceptance by drug designers. Indeed, for the Third World countries confronted with the problem of obnoxious and obsolete drugs, Dr. Sudhindra's research, pregnant with potential to reduce drug formulations to a considerable extent, can't but be a 'manna'.

Medicine comes in myriad forms: pills, capsules and phials

Interaction with Aero Experts at Bangalore

EDUCATIONPLUS

YOUR WINDOW TO COURSES AND CAREERS

KARNATAKA · MONDAY, DECEMBER 27, 2010

INSIDE

2 HOT SUBJECT CYBER LAW

3 IN DEMAND BIOTECH STUDIES

3 USE A CAMERA Q & A

4 RIGHT CHOICE STUDENTSPEAK

APPLICATION ORIENTED: *The IGNOU course is open to diploma holders and the curriculum is based on the needs of the aviation sector*– PHOTOS: AFP

Take to the skies with IGNOU

Bangalore regional centre all set to

(ATM) course has many firsts to its credit. It is the first such course at the graduate level

Aviation (DGCA) and the Centre for Military Airworthiness and Certification

tured theory courses with 216 credits and 14 practical papers having 28 credits.

engineering colleges across the country at present.

"The course was designed

with two years working experience will have minimum practical knowledge when

dustries have shown interest in sending their employees for the course," he added.

theory and practical classes.

R. Balasubramaniam, a retired scientist of NAL, who is the senior consultant for IGNOU's B.Tech (ATM), said that it has been projected by studies in the aviation sector that India will require about 5,000 to 10,000 qualified engineers for aircraft maintenance by the next five years and at present no course is available in the country for the sector.

"At present, aircraft are being sent abroad for maintenance due to lack of qualified engineers and maintenance

An opportunity to create an unique B. Tech program in Aircraft Maintenance.

ATTENTION NXT GEN!

India needs **KNOWLEDGE PLUS** Skill based Human Resources to Maintain "Flying Machines " viz. Aeroplanes, Helicopters, Drones, Reusable spacecraft etc in huge numbers. AGAIN an opportunity for NxtGen to contribute!

The Team @ Pune

Interaction with teachers during Orientation Program at Bangalore

HAD THE GREAT OPPORTUNITY TO INTERACT WITH INNUMERABLE EDUCATIONISTS, SCIENTISTS, TEACHERS AND STUDENTS THROUGHOUT MY CAREER.

Molecular Medicine: The Road

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This work is a reflection of author's activity after his PHD, in 1974, from IISc.
We define the area of Molecular Medicine as one involved in understanding the features of how, where and why a "Therapeutic" molecules works with the human body in disease state. It encompasses the various conventionally designated fields like Chemistry, Biology, Pharmacology, Bio-/chemoinformatics, etc. deserving a separate exclusive field of study. We outline below what these are and how one can go about it. To begin with we define chemistry as acronym for easy flow of thought required for our purpose.

CHEMISTRY is " Combination and Hopping of Elements Making Interesting Structures, Theories , Reactions and Yields "

A simple yet most saving thumb rule namely – Need to consider interactions between inter-molecular atoms if they are in the range 2.8A to 4.0A only is highlighted. This helps one to construct active site of receptors.

ATTENTION NXT GEN!

Using Maths and computer graphic in todays Laptops you can work in the area of molecular modelling to discover newer **"lead molecules"** for developing new medicines. India needs more people to work in this area to understand AYUSH System molecularly. You have the opportunity to contribute to Indian health sciences.

writing a complete answer to a maths question*

Frame *# 25*

STRETCH/STRAIN YOUR MIND AND IMAGINATION TO ARRIVE AT THE SOLUTION IN STAGES

[i.e. First reason then, step leading to result.]

Logical deductions

Logic: Reason-1
We know that .....
Intermediate Result-1 [m_1]
Logic: Reason-2
We know that...
As, because, for
Intermediate Result-2 [m_2]
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Therefore.... Final result = Answer ! [m_f]

$m = m_1 + m_2 + \ldots m_f$

[m_1 marks for each step.]

= total marks for the problem.

You have a to write repeatedly at each steps in words / sentences.... why you do so, 'to make your reader (Teacher or Evaluator) to recognize that you know the subject.

Note:
Skipping steps must be AVOIDED in the early stages of writing solutions.

BSS, 15 Nov, 2016

* Maths Q = Maths problem; Complete answer = Solving ..... just different language usages.

Get... Set... Go...

Frame
 # 26

START TODAY 4 UR SUCCESS

- Exam is between you and your University/Board.
- It does not matter what other Do.
- Your score depends on your efforts only.
- FIRST AIM to score passing marks in each the of subjects.
- THEN GO for higher marks in your field subjects.

IMP ➡ I MUST PASS !

BSS-3; 24/10/2002

BEST
WISHES

Making Maths Digestible to Billions... FOLK-CAP Way

Success doesn't come from
what you do occasionally.
It comes from what you
do consistently.

IN THE 21ST CENTURY THE ROLE OF A TEACHER IS THAT OF A FACILITATOR

Follow Dr. B S Sudhindra's

RULE OF THREE

to understand any DIFFICULT subject

Rule 1: Get familiar with Sight Words & Phrases in the subject area you are studying.

Rule 2: Be aware of signs, Units and Symbols used in the topic.

Rule 3: The rule of the game/procedure followed.

GIVE A TRY & EXPERIENCE THE WELCOME CHANGE !

IN ACADEMICS, FAMILIARITY BREEDS CONFIDENCE !

BSS/D[RSD]/March 2011

310....

"Every student is a
Distance Learner
during off-school hours!"

BSS 310 of nn 3-12-2017 8:06am

CAN YOU MAKE IT READY?

Making Maths Digestible to Billions... FOLK-CAP Way

E-version 15-12-2025