

From the Death of Arithmetic to the...



From the Death of Arithmetic to the...



Maths Of Divine India!

INDIA WE HAVE A PROBLEM



Many Hate or Fear Your Maths

Please take a minute to sign the online petition for Bharatan Maths in India's primary classrooms @

www.change.org/Brahmagupta

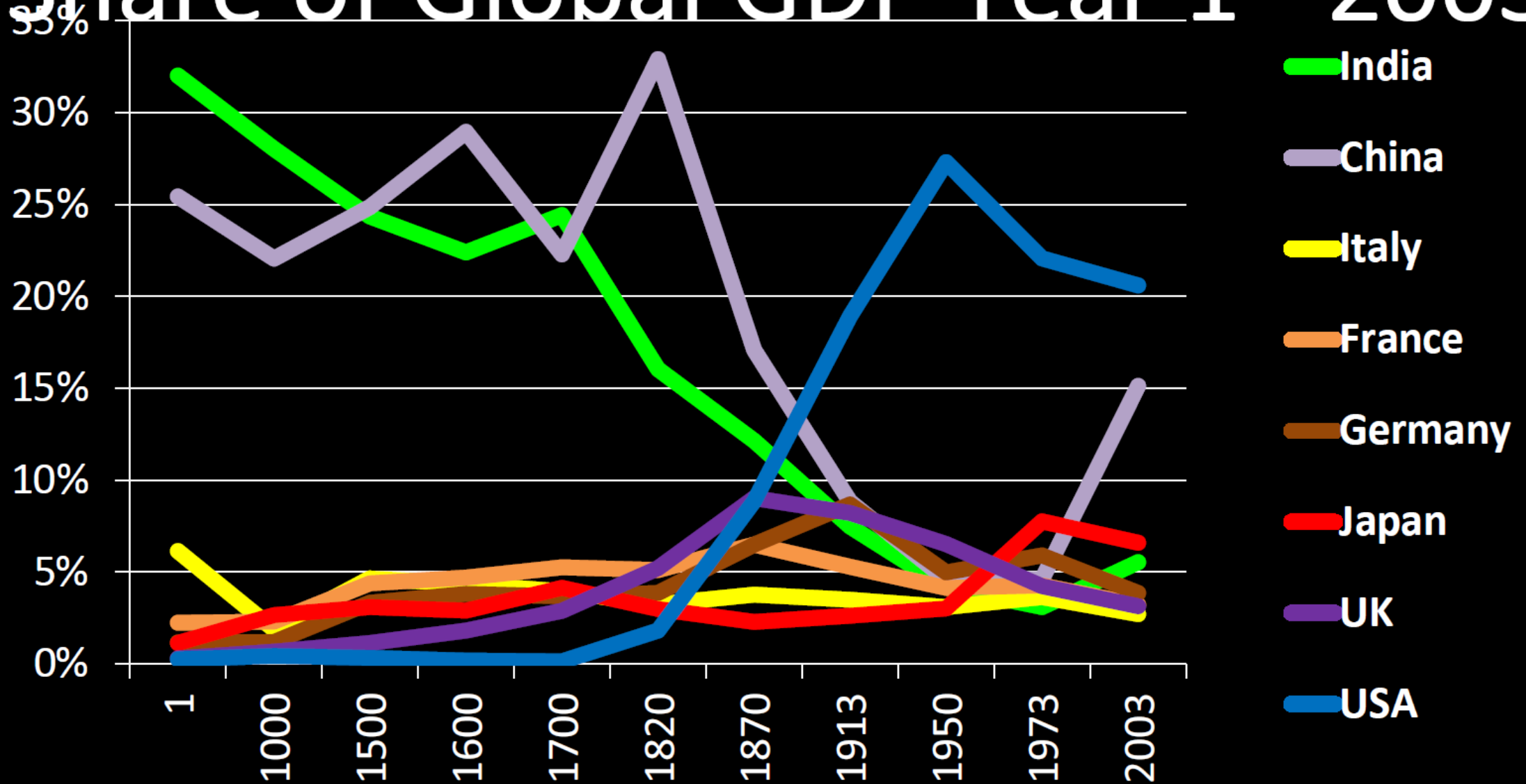
INDIA WE HAVE A PROBLEM



Many Hate or Fear Your Maths
What happened?

**India and China used to
lead the world in
mathematics
and be the world's
leading economies.**

Share of Global GDP Year 1 - 2003



Indian students rank 2nd last in global test

TNN | Jan 15, 2012, 02.24 AM IST



School students celebrate after checking their CBSE results. A global survey has found that the average 15-yea... [Read More](#)

MUMBAI: Across the world, India is seen as an education powerhouse — based largely on the reputation of a few islands of academic excellence such as the IITs. But scratch the glossy surface of our education system and the picture turns seriously bleak.

Fifteen-year-old Indians who were put, for the first time, on a global stage stood second to last, only beating Kyrgyzstan when tested on their reading, math and science abilities.

India ranked second last among the 73 countries that participated in the Programme for International Student Assessment (PISA), conducted annually to evaluate education systems worldwide by the OECD (Organisation for Economic Co-operation and Development) Secretariat. The survey is based on two-hour tests that half a million students are put

through.

Tamil Nadu and Himachal, showpieces of India's education and development, fared miserably at the Programme for International Student Asssment, conducted by the Organisation for Economic Co-operation and Development Secretariat.

In math, considered India's strong point, they finished second and third to last, beating only Kyrgyzstan

PISA Mathematics Survey?

(Programme for International Student Assessment)

In Tamil Nadu and Himachal Pradesh 15% and 12% of students are ready to use mathematics in ways that are considered fundamental for their future development.

<https://www.acer.org/au/about-us/media/media-releases/acer-releases-results-of-pisa-2009-participant-economies>

PISA Mathematics Survey?

(Programme for International Student Assessment)

In Tamil Nadu and Himachal Pradesh 15% and 12% of students are ready to use mathematics in ways that are considered fundamental for their future development.

The OECD average is 75%.

<https://www.acer.org/au/about-us/media/media-releases/acer-releases-results-of-pisa-2009-participant-economies>

PISA Science Survey?

In Tamil Nadu and Himachal Pradesh 16% and 11% of students are proficient in science ... to participate actively in life situations related to science and technology.

<https://www.acer.org/au/about-us/media/media-releases/acer-releases-results-of-pisa-2009-participant-economies>

PISA Science Survey?

In Tamil Nadu and Himachal Pradesh 16% and 11% of students are proficient in science ... to participate actively in life situations related to science and technology.

The OECD average is 82%.

<https://www.acer.org/au/about-us/media/media-releases/acer-releases-results-of-pisa-2009-participant-economies>

Blogs

[Home](#) [Blogs](#) [Times View](#) [Readers' Blog](#) ^{New} [Times Impact](#) [City](#) [India](#) [World](#) [Entertainment](#) [Sports](#) [Lifestyle](#) [Environment](#)

[News](#) » [Blogs](#) » [India Blogs](#) » PISA: China tops. India has fled the race

PISA: China tops. India has fled the race

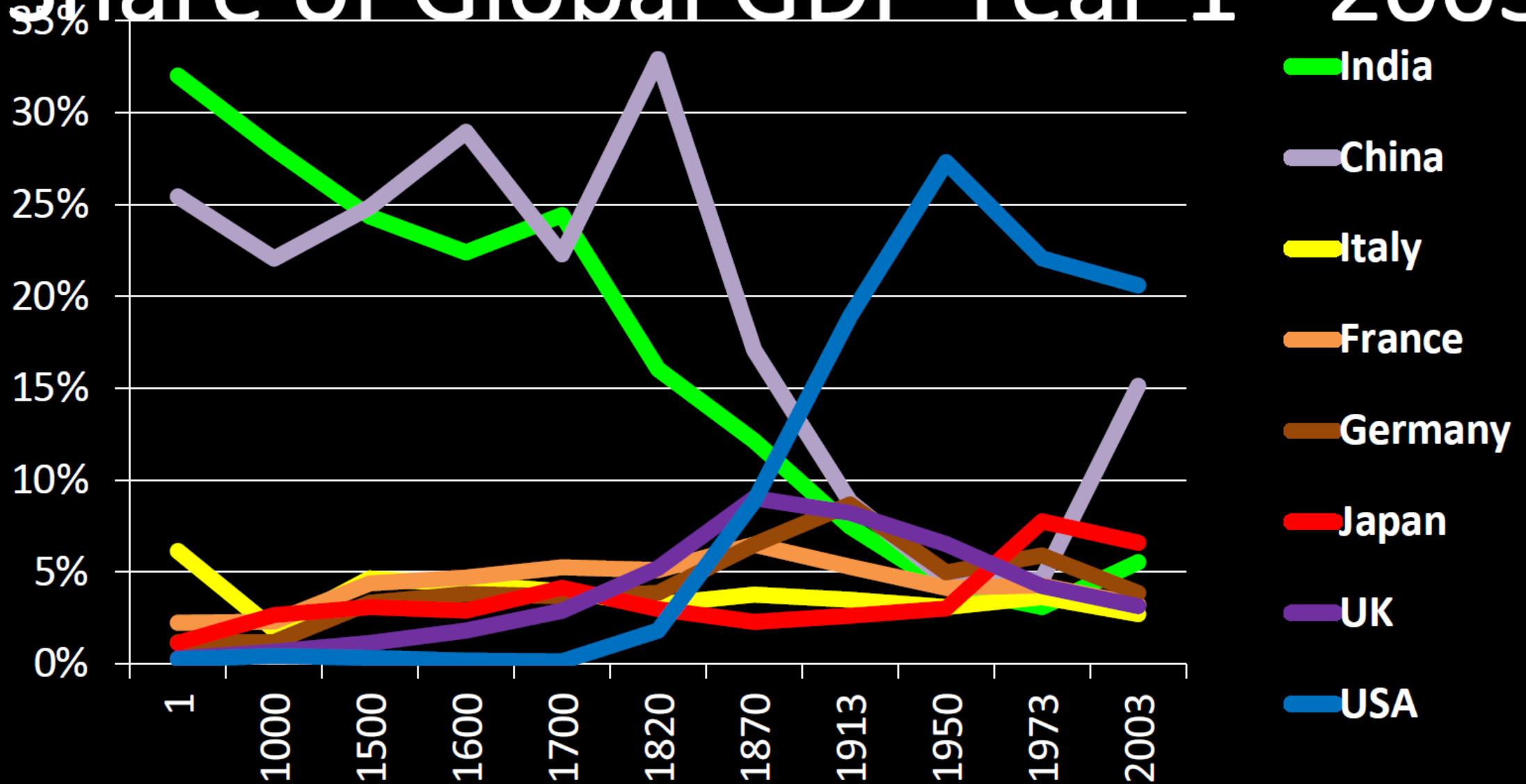
December 4, 2013, 2:48 PM IST

Malini Goyal in The Roving Eye | India | ET

PISA (Programme for International Student Assessment) scores are just in. China is on top. Asian countries dominate from China to South Korea, Japan, South Korea, Taiwan and Macau. The US lags. The UK does slightly better. Scandinavian countries, on top for a long time, have been slipping.

So where is India? No where. In 2009 study, India ranked 73 out of 74 nations. So to avoid embarrassment, the Indian government decided that it will not participate in the latest study. Weirdly, the Indian government has cited the disconnect between the testing parameters and what our children are taught in school as the reason not to participate.

Share of Global GDP Year 1 - 2003



Notes on my mission to rebuild elementary maths from zero.

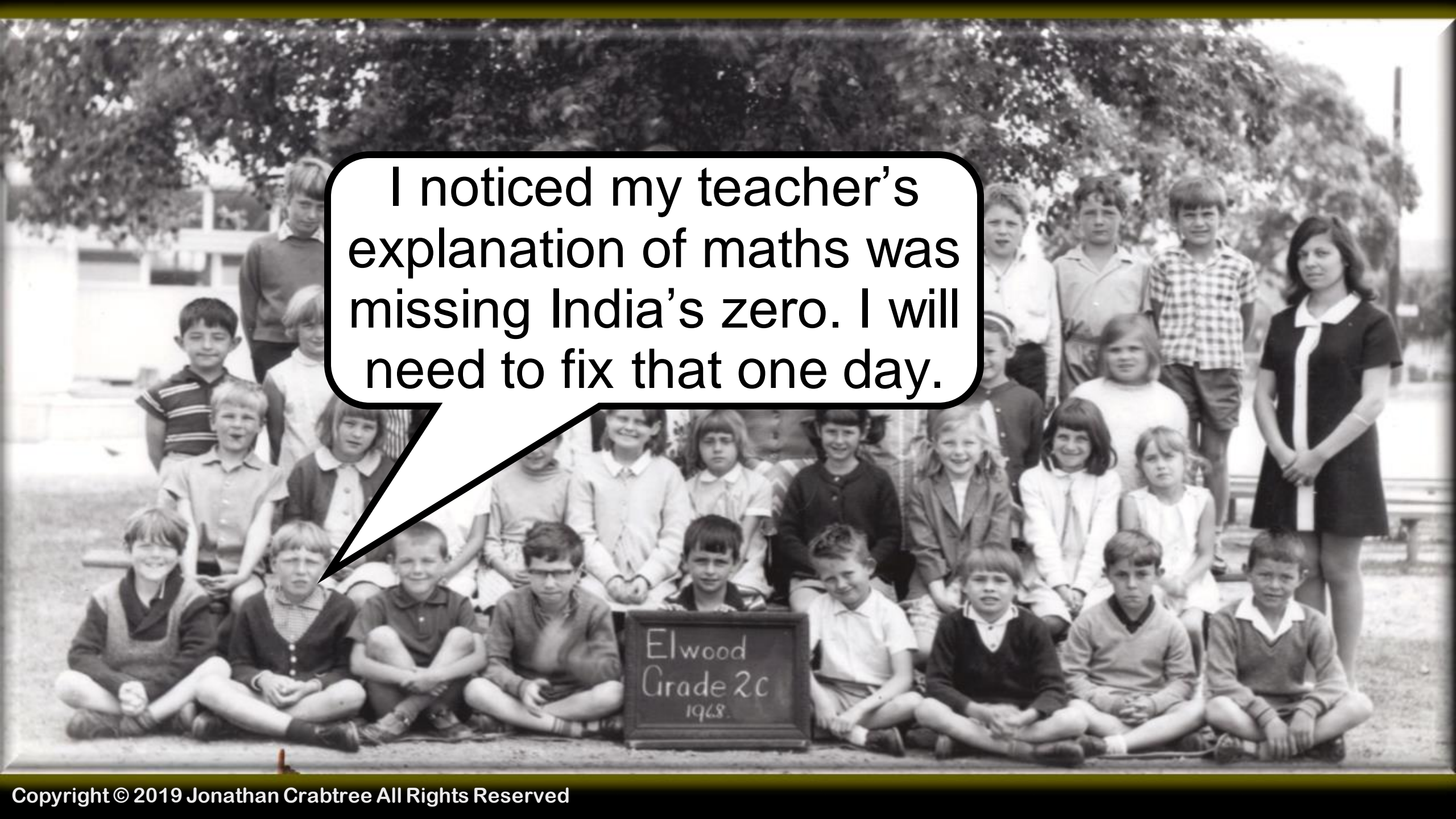


Jonathan J. Crabtree: Srijan Foundation Talk

www.podometic.in

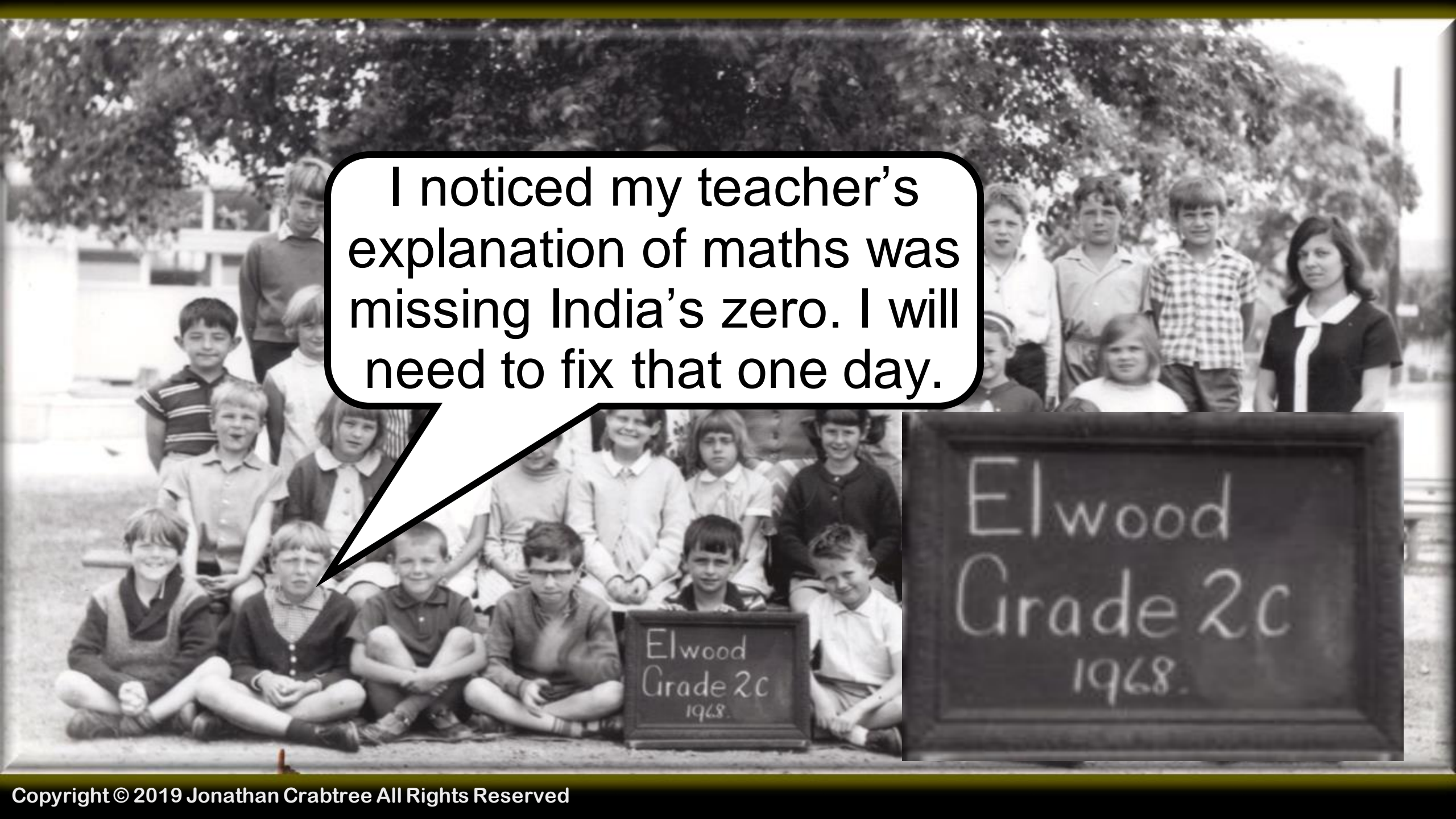
Indian National Trust for Art and Cultural Heritage INTACH

New Delhi India, 14th December 2019



I noticed my teacher's explanation of maths was missing India's zero. I will need to fix that one day.

Elwood
Grade 2c
1968



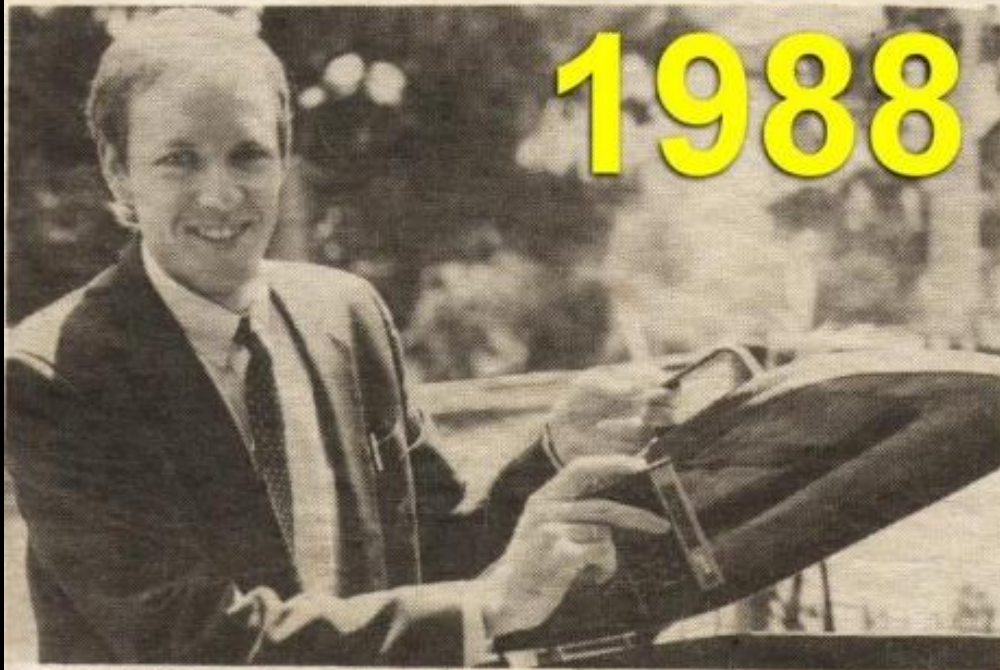
I noticed my teacher's explanation of maths was missing India's zero. I will need to fix that one day.

Elwood
Grade 2C
1968.

Elwood
Grade 2C
1968.

Maths? It's all in the mind, says Jonathon

1988



JONATHAN throws away his calculator and uses brain powers to solve even the hardest of equations.

IF you were asked what day it was on July 24, 1706, what would you say?

It's all in the mind, he says.

After a four second calculation he came up with the correct day.

Jonathon broke the world record for

"I hope to change the way the Western world teaches maths," Jonathon said.

Jonathon will be holding two classes at the Park Orchards Community Centre.

The first is *Memory Unlimited*, which

"I hope to change the way the Western world teaches maths," Jonathon said.

Crabtree's counting on a new number system



JONATHAN Crabtree would like to see the way children learn maths changed. The long man has changed the whole world.

"We moved from a Roman numeral system to a Hindu-Arabic system and now I am introducing a new system," Crabtree said. "The reason is that the old system has been hated for centuries."

simple improvement in a product overdue by over a thousand years."

"What I am doing is summarising all the maths number theory up until

a vertical axis because it reflects the world in which children live.

Jonathan Crabtree and Podo.

"My new



NEWS

SHARE    ...

Seaholme man's dogged determination

EDUCATION 29 MAY 12 @ 01:19PM | BY FIONA O'DOHERTY

Printer Friendly 

Text size A⁻ A⁺



LYING on his back in hospital with a smashed spine and facing the prospect of never walking again, Jonathan Crabtree made an unusual promise to a God he didn't believe in at the time.

"Let me walk and have children, and I will change the way the world does maths," Mr Crabtree said.

Twenty-five years later the Seaholme resident is walking, has children and is on his way to keeping his promise with the help of Podo the Super Puppy.

Mr Crabtree was badly hurt in a motorcycle accident at 21 and spent months in hospital, which gave him time to ponder what seemed a bleak future.

Jonathan Crabtree with Super Puppy Podo have a new method for teaching maths to children. Picture: DAVID SMITH



THE LOST LOGIC OF ELEMENTARY MATHEMATICS AND THE HABERDASHER WHO KIDNAPPED KAIZEN

Jonathan Crabtree **Download the paper @** www.bit.ly/LostLogicOfMath

www.jonathancrabtree.com | Mathematics Historian

Euclid's multiplication definition from Elements, (c. 300 BCE), continues to shape mathematics education today. Yet, upon translation into English in 1570 a 'bug' was created that slowly evolved into a 'virus'. Input two numbers into Euclid's step-by-step definition and it outputs an error. Our multiplication definition, thought to be Euclid's, is in fact that of London haberdasher, Henry Billingsley who in effect kidnapped kaizen, the process of continuous improvement. With our centuries-old multiplication definition revealed to be false, further curricular and pedagogical research will be required. In accordance with the Scientific Method, the Elements of western mathematics education must now be rebuilt upon firmer foundations.

The background of the image is a serene coastal scene. In the foreground, there are several large, dark, wet-looking rocks scattered across a sandy beach. The ocean stretches out in the middle ground, meeting a sky that is a mix of soft orange, pink, and light blue, suggesting the time is either dawn or dusk. In the far distance, low hills or mountains are visible on the horizon. The overall mood is peaceful and contemplative.

**You can't cross the sea
merely by standing and
staring at the water.**

Rabindranath Tagore



**I must travel to find out if there is demand for India's
original and true foundations of mathematics.**

**You can't cross the sea
merely by standing and
staring at the water.**

Rabindranath Tagore



Please take a minute to sign the online petition for Bharatan Maths in India's primary classrooms @

www.change.org/Brahmagupta







রিলাঞ্চ অফ ইন্ডিয়ান ম্যাথমেটিক্স পর সংগোষ্ঠী

ভারতীয় গণিত ইতিহাসের উপর আলোকপাত করা হয়েছে।

ভারতীয় গণিত ইতিহাসের উপর আলোকপাত করা হয়েছে।



রামানুজনের জন্মদিনে সহজ গণিত পদ্ধতি উপহার

রাজ্যের প্রতিটি স্কুলে বিনামূল্যে সহজ গণিত শিক্ষার বই দিতে চান অস্ট্রেলিয়ার গণিতজ্ঞ

রামানুজনের জন্মদিনে সহজ গণিত পদ্ধতি উপহার

ভীতি কাটাতে শহরে গণিতজ্ঞ

আজকালের প্রতিবেদন

ভারতীয় গণিত ইতিহাসের উপর আলোকপাত করা হয়েছে।

Jonathan J. Crabtree

FOTO FACT NEWS

Volume 1, Issue 49 (Weekly) • Kolkata Edition • 12-November-18 November 2018 • ISSN No. 2228-0000



Jonathan J. Crabtree Elementary Mathematics Historian from Melbourne addressing in connection to organise a seminar on "Relaunch of Indian Mathematics" at Rotary Sadan, in association with Indian Red Cross Society and AFX Animation. (Pic. Md. Iqbal Khan)

১ থেকে ৫ গুনতে জানলেই জটিল অঙ্ক হবে সহজ, কাটবে ভীতি

সৌগত সরকার

সেই খুঁজো আজ কল করেছে আপনি যুদ্ধ বলে
পাঁচ ঘণ্টার রাত্তা যাবেন বেড় শব্দীয় চলে
মেখে এলুম কলটি জন্ম সহজ এবং সৌন্দর্য
যদি পাঁচকে খটলে পরে আপনি হবে কোথা।।

"Brahmagupta's 18 laws of mathematics are completely missing from India's present mathematics curriculum."

Jonathan J. Crabtree

Why and when did you feel that there were some mistakes in basic mathematical concepts?

A. Fifty years ago, in 1968, my Class 2 teacher gave me the

***“It is better to know nothing
than to know what isn't true”***

*“It is better to know nothing
than to know what isn't true”*

Josh Billings 1874

American Humourist

Arithmetic?

Basic Operations (+, −, ×, ÷) on

Arithmetic?

Basic Operations (+, −, ×, ÷) on

... −3 −2 −1 0 +1 +2 +3 ...

**Obviously India's ancient
integer logic got to us today.**

Obviously India's ancient
integer logic got to us today.

But how?

What FACTS do we know?

What FACTS do we know?

India's definition of zero as a number and Integer arithmetic was embraced by the Arabic world HAN

What FACTS do we know?

India's definition of zero as a number and Integer arithmetic was embraced by the Arabic world HAN

Al-Khwarizmi wrote a book on Hindu Integer arithmetic which featured Brahmagupta's ancient laws of sign for negatives and positives

What FACTS do we know?

India's definition of zero as a number and Integer arithmetic was embraced by the Arabic world HAN

Al-Khwarizmi wrote a book on Hindu Integer arithmetic which featured Brahmagupta's ancient laws of sign for negatives and positives

Based on what he learned from the Indians, al-Khwarizmi then wrote a book on algebra

What FACTS do we know?

From the Arabic world, India's mathematical foundations made their way to North Africa where Leonardo Pisano (AKA Fibonacci) mastered them

What FACTS do we know?

From the Arabic world, India's mathematical foundations made their way to North Africa where Leonardo Pisano (AKA Fibonacci) mastered them

Leonardo Pisano then documented India's mathematical foundations involving Brahmagupta's definition of zero as a number

What FACTS do we know?

From the Arabic world, India's mathematical foundations made their way to North Africa where Leonardo Pisano (AKA Fibonacci) mastered them. Leonardo Pisano then documented India's mathematical foundations involving Brahmagupta's definition of zero as a number.

Thus, Europe came to understand Indian arithmetic.

The Transmission of India's Integer Arithmetic

India
7th century



Shadings for illustrative purposes only

© 2019 J. J. Crabtree | All Rights Reserved
www.podometic.in

The Transmission of India's Integer Arithmetic

India
7th century



Arabic World
9th century



The Transmission of India's Integer Arithmetic

India
7th century



Arabic World
9th century



Europe
13th century



Shadings for illustrative purposes only

© 2019 J. J. Crabtree | All Rights Reserved
www.podometic.in

What FACTS do we know?

Zero is defined as $n - n$

What FACTS do we know?

Zero is defined as $n - n$

Negative numbers are less than zero

What FACTS do we know?

Zero is defined as $n - n$

Negative numbers are less than zero

Negative seven is less than negative four $-7 < -4$

What FACTS do we know?

Zero is defined as $n - n$

Negative numbers are less than zero

Negative seven is less than negative four $-7 < -4$

Every basic arithmetical operation (+, −, ×, ÷) on the Integers is understood and has been for centuries

What FACTS do we know?

Euclid in his book *Elements* defined multiplication as repeated addition

What FACTS do we know?

Euclid in his book *Elements* defined multiplication as repeated addition

ab is thus defined as ***a*** added to itself ***b*** times

What FACTS do we know?

Euclid in his book *Elements* defined multiplication as repeated addition

ab is thus defined as a added to itself b times

a^b is thus defined as a into itself b times

So, if that is arithmetic...

So, if that is arithmetic...

Jonathan J Crabtree

So, if that is arithmetic...

Jonathan J Crabtree

**WELCOMES YOU
ON A JOURNEY**

From the Death of Arithmetic



From the Death of Arithmetic



To the Birth of Podometric

***“It is better to know nothing
than to know what isn't true”***

**What we know about
arithmetic isn't true!**

**What we know about
arithmetic isn't true!**

**Every previous
FACT is FALSE**

**What we know about
arithmetic isn't true!**

**Every previous
FACT is FALSE**

Everyone is entitled to their own opinion, yet not to their own facts.

**Let arithmetic die and
be reborn from ZERO!**

**Let arithmetic die and
be reborn from ZERO!**

Extraordinary claims
require
extraordinary evidence

**Let arithmetic die and
be reborn from ZERO!**

Extraordinary claims
require
extraordinary evidence ✓

Extraordinary Claims

- India's definition of **ZERO** never made it to either the ancient Arabic world or Europe.

Extraordinary Claims

- India's definition of **ZERO** never made it to either the ancient Arabic world or Europe.
- In the Arabic world, India's **ZERO** only came to exist as a placeholder, not as the power tool to solve simple problems like $+3$ minus $+4$, or -2 minus -4 , or -4 minus $+2$

Extraordinary Claims

- India's definition of **ZERO** never made it to either the ancient Arabic world or Europe.
- In the Arabic world, India's **ZERO** only came to exist as a placeholder, not as the power tool to solve simple problems like $+3$ minus $+4$, or -2 minus -4 , or -4 minus $+2$

Extraordinary Claims

- India's definition of **ZERO** never made it to either the ancient Arabic world or Europe.
- In the Arabic world, India's **ZERO** only came to exist as a placeholder, not as the power tool to solve simple problems like $+3$ minus $+4$, or -2 minus -4 , or -4 minus $+2$

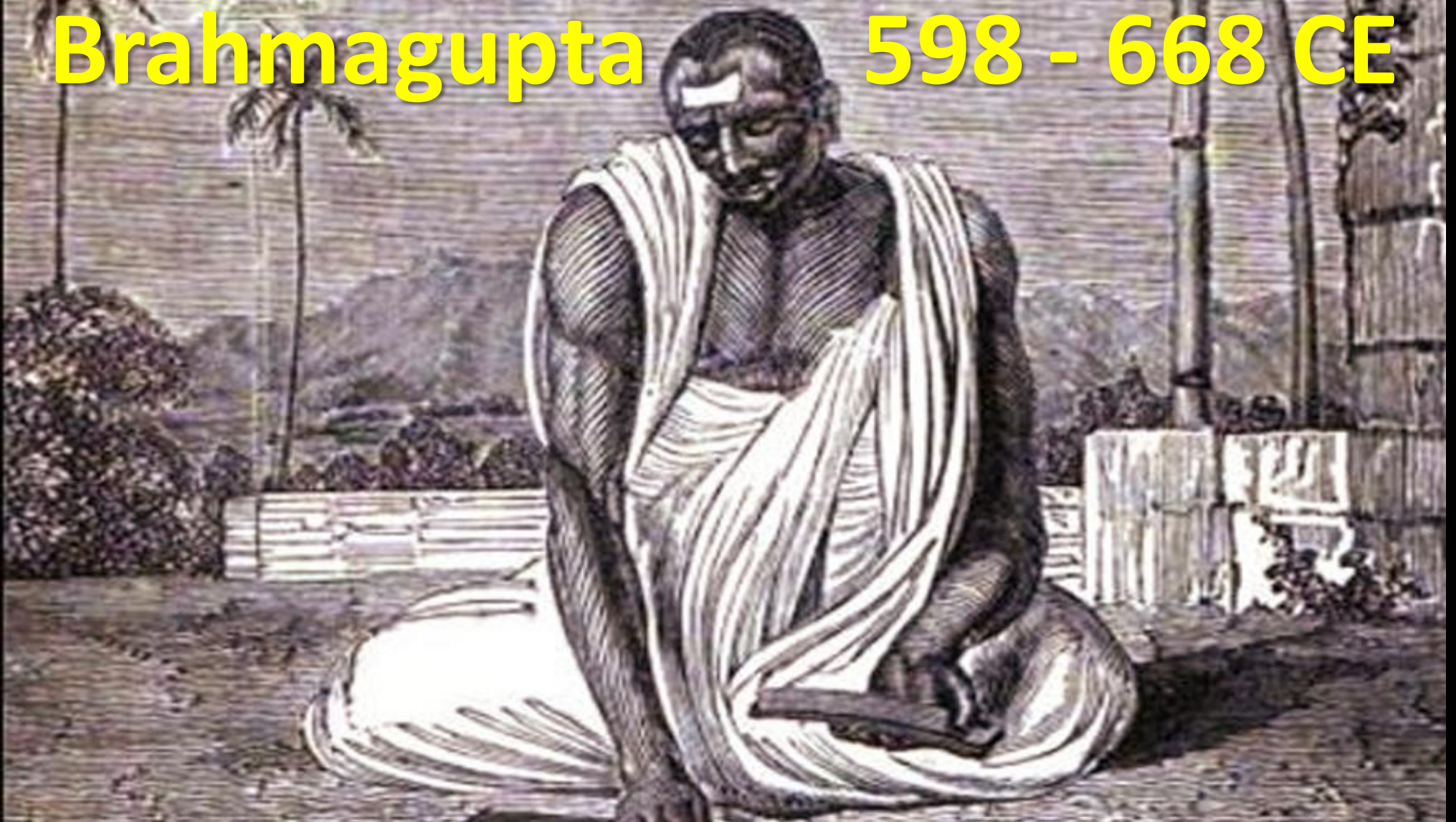
Extraordinary Evidence...

Brahmagupta

598 - 668 CE

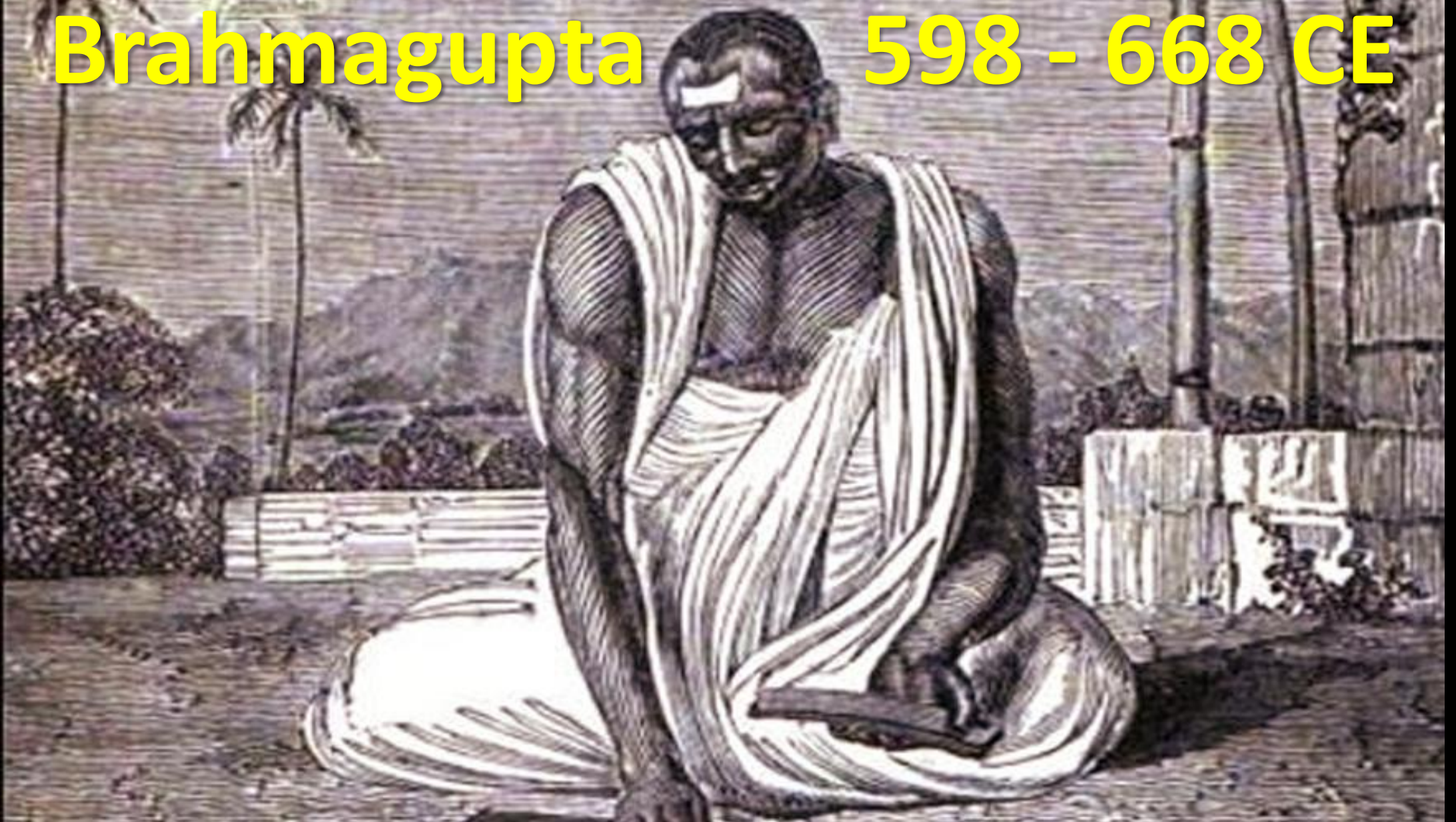


Brahmagupta 598 - 668 CE



Astronomer and Mathematician

Brahmagupta 598 - 668 CE



Brāhmasphuṭasiddhānta 628 CE

For this talk,
Brahmagupta's
Laws of **Positives**
Negatives and
Zero have been
freshly analysed.

Images courtesy of
the British Library.

REPRINT FROM THE PANDIT.

ब्राह्मस्फुटसिद्धान्तो

ध्यानग्रहोपदेशाध्यायश्च ।

गणकचक्रचूडामणिश्रीब्रह्मगुप्तविरचितः ।

महामहोपाध्यायसुधाकरद्विवेदिकृतनूतन-
तिलकसमेतः ।

BRĀHMASPHUṬASIDDHĀNTA

AND

DHYĀNAGRAHOPADEŚĀDHYĀYA,

BY BRAHMAGUPTA,

EDITED WITH HIS OWN COMMENTARY

BY

MAHĀMAHOPĀDHYĀYA SUDHĀKARA DVIVEDIN,

Professor, Queen's College, Benares.



BENARES:

PRINTED AT THE MEDICAL HALL PRESS.

1902.

P.1 1 अथ धनर्णशून्यानां सङ्कलनम् ।

2 धनयोर्धनमृणमृणयो-

3 धनर्णयोरन्तरं समैक्यं खम् ।

4 ऋणमैक्यं च धनमृणध-

5 नशून्ययोः शून्ययोः शून्यम् ॥ ३० ॥ (३१)

6 धनयोरैक्यं धनमृणयोरैक्यमृणं भवति । धनर्णयोरन्तरमेकैक्यं भव-
7 ति । समयोर्धनर्णयोरैक्यं खं शून्यं भवति । ऋणशून्ययोरैक्यमृणं धनशू-
8 न्ययोरैक्यं धनं शून्ययोरैक्यं च शून्यं भवति ।

9 अत्रोपपत्त्यर्थं मन्मुद्रिता भास्करबीजटिप्पणी द्रष्टव्या ॥ ३० ॥

10 इदानीं व्यवकलनमाह ।

11 ऊनमधिकाद्विशोध्यं धनं धनादृणमृणादधिकमूनात् ।

12 व्यस्तं तदन्तरं स्यादृणं धनं धनमृणं भवति ॥ ३१ ॥ (३२)

13 शून्यविहीनमृणमृणं धनं धनं भवति शून्यमाकाशम् ।

14 शोध्यं यदा धनमृणादृणं धनाद्वा तदा क्षेप्यम् ॥ ३२ ॥ (३३)

15 अधिकादुनादूनं धनं विशोध्यं शेषं धनं भवति । अधिकादृणादू-

16 नमृणं विशोध्यं शेषमृणं भवति । ऊनादुनादधिकं धनं वानादृणादधिक-

17 मृणं विशोध्यं तदा तदन्तरं व्यस्तं विपरीतं स्यात् । अर्थादधिकं धनं वि-

18 शोध्यं तदा शेषमृणं भवति । अधिकमृणं विशोध्यं तदा शेषं धनं भव-

19 ति । कथं विपरीतं भवतीत्याह । ऋणं धनं भवति धनं चर्णं भवतीति ।

20 चेदृणं शून्यविहीनं शून्येन विहीनं तदा ऋणं धनं च शून्यविहीनं धनं शून्यं

21 च शून्यविहीनमाकाशं शून्यं भवति । यदि ऋणादुनं शोध्यं वा धनादृणं

22 शोध्यं तदा क्षेप्यमर्थात् तदा तयोर्योग एवान्तरं भवतीति ।

23 अत्रोपपत्त्यर्थं मन्मुद्रिता भास्करबीजटिप्पणी विलोक्या ॥ ३१-३२ ॥

P.2

24 इदानीं गुणने करणसूत्रम् ।

25 ऋणमृणधनयोर्धातो धनमृणयोर्धनवधो धनं भवति ।

26 शून्यर्णयोः खधनयोः खशून्ययोर्धा वधः शून्यम् ॥ ३३ ॥ (३४)

27 ऋणधनयोर्धात ऋणं भवति । ऋणयोर्वधो धनवधो धनयोर्वधश्च

28 धनं भवति । शून्यर्णयोः खधनयोः शून्यधनयोर्धा खशून्ययोश्च वधः शून्यं

29 भवति ॥ ३३ ॥

30 इदानीं भागहारे करणसूत्रं वृत्तद्वयम् ।

31 धनभक्तं धनमृणहृतमृणं धनं भवति खं खभक्तं खम् ।

32 भक्तमृणेन धनमृणं धनेन हृतमृणमृणं भवति ॥ ३४ ॥ (३५)

33 खोद्धृतमृणं धनं वा तच्छेदं खमृणधनविभक्तं वा ।

34 ऋणधनयोर्वर्गः स्वं खं खस्य पदं कृतिर्यत् तत् ॥ ३५ ॥ (३६)

35 धनं धनभक्तं वा ऋणं ऋणभक्तं फलं धनं भवति । खभक्तं खं

36 फलं खं भवति । ऋणेन धनं भक्तं फलमृणं स्यात् । धनेन ऋणं हृतं फल-

37 मृणं भवति । ऋणं वा धनं खेनोद्धृतं तच्छेदं तस्य शून्यस्य छेदो यस्मि-

38 नृणे वा धने तच्छेदं भवति । एवं खं शून्यमृणधनविभक्तं (शून्यं) वा त-

39 छेदं भवति । फलं शून्यं भवति वा शून्यं तद्वरं स्यादित्यर्थः । ऋणधन-

40 योर्वर्गः स्वं भवति । खस्य वर्गः खं भवति । तदेव वर्गस्य पदं भवति

41 यत्कृतिः स एव वर्गो भवेदिति । भास्करबीजेऽप्येतदेव सर्वम् । अत्र

42 खभक्तं खमर्थात् ० इदं सर्वदा शून्यसमं नेत्येतदर्थं चलनकलनं विलो-

43 क्यम् ॥ ३४-३५ ॥

44 इदानीं सङ्क्रमणविषमकर्माह ।

45 योगोऽन्तरयुतहीनो द्विहृतः सङ्क्रमणमन्तरविभक्तं वा ।

46 वर्गान्तरमन्तरयुतहीनं द्विहृतं विषमकर्म ॥ ३६ ॥ (३७)

47 योगो राश्यार्वर्गोऽन्तरेण राश्यन्तरेण युतो हीनश्च द्विहृतो दलि-

48 तो राशी स्तः । इदं सङ्क्रमणं नाम गणितम् । वा राश्यार्वर्गान्तरं राश्य-

Please take a minute to sign the online petition for Bharatan Maths in India's primary classrooms @

www.change.org/Brahmagupta

Brahmagupta's 5 Addition Laws AL (*saṅkalana*)

AL1

धनयोर्धनम्

positive plus positive is positive

AL2

ऋणामृणयो

negative **plus** negative **is** negative

AL3

धनार्णयोरन्तरं

positive plus **negative** is the difference
between the **positive** and the **negative**

AL4

समैकं खम्

when **positive** and **negative**
are equal the sum is...

ZERO

AL4

समं खम्

when **positive** and **negative**
are equal the sum is...

ZERO

AL5 part 1

ऋणमैक्यं च धनमृणधनशून्ययो

positive plus zero is positive

AL5 part 2

ऋणमैकं च धनमृणधनशून्ययो

negative plus zero is negative

AL5 part 3

शून्ययोः शून्यम्

zero plus zero is zero

AL5

ऋणमैक्यं च धनमृणधनशून्ययो

शून्ययोः शून्यम्

[positive plus zero is positive
negative plus zero is negative
zero plus zero is zero]

Brahmagupta's 5 Addition Laws

AL1 positive plus positive is positive

AL2 negative plus negative is negative

AL3 positive plus negative is the difference between the positive and negative

AL4 when positive and negative are equal the sum is zero

AL5 positive plus zero is positive
negative plus zero is negative
zero plus zero is zero

Brahmagupta's 5 Addition Laws

AL1 positive plus positive is positive

AL2 negative plus negative is negative

AL3 positive plus negative is the difference between the positive and negative

AL4 when positive and negative are equal the sum is zero

AL5 positive plus zero is positive
negative plus zero is negative
zero plus zero is zero

Brahmagupta's 5 Addition Laws

AL1 positive plus positive is positive Understood in Arabic world

AL2 negative plus negative is negative

AL3 positive plus negative is the difference between the positive and negative

AL4 when positive and negative are equal the sum is zero

AL5 positive plus zero is positive
negative plus zero is negative
zero plus zero is zero



Al-Khwarizmi (c. 780-850)

I had seen that the Indians had set up **9 symbols** in their universal system of numbering...

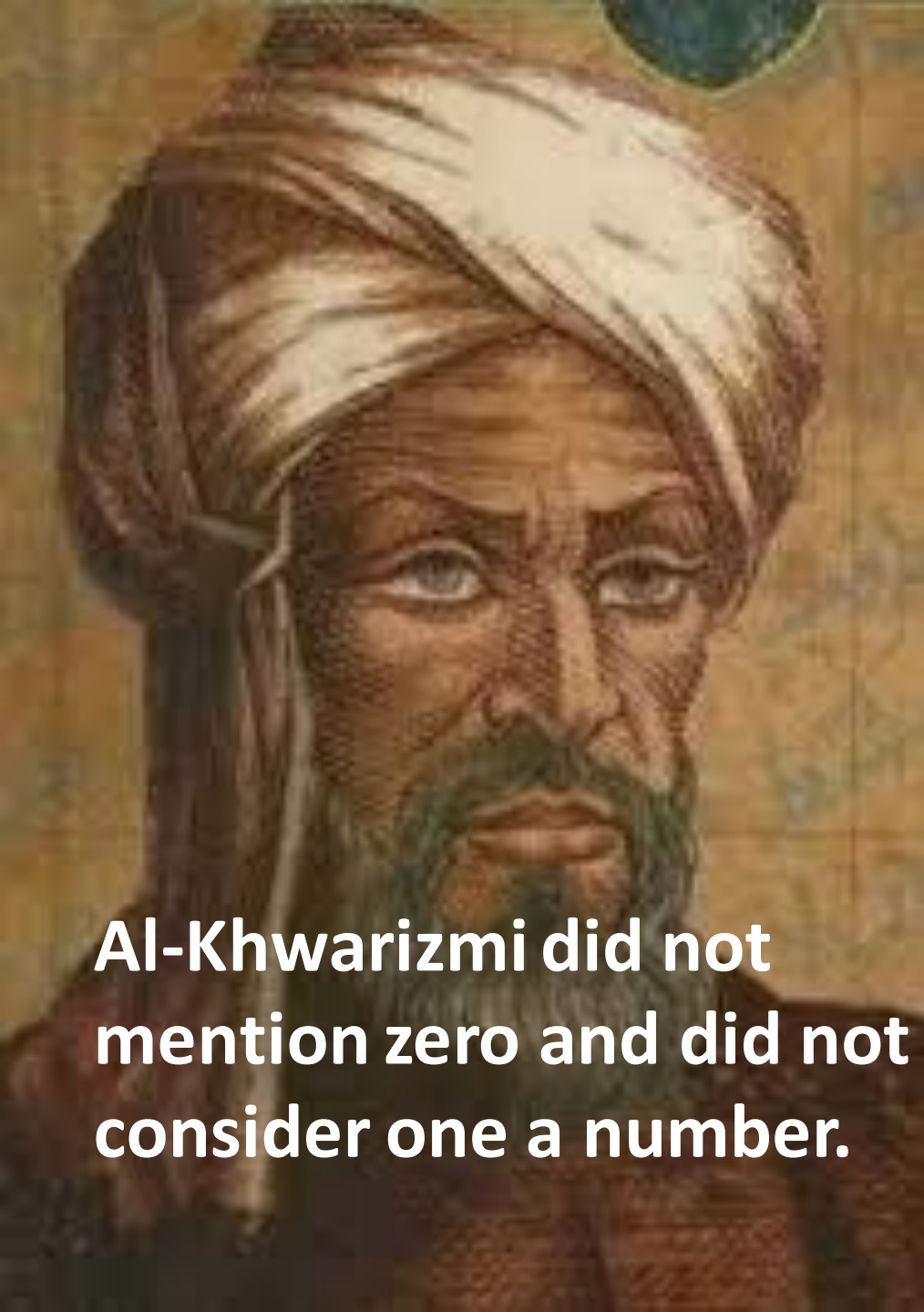


Al-Khwarizmi did not
mention zero

Al-Khwarizmi (c. 780-850)

So they made **9 symbols**, which are
these: 9 8 7 6 5 4 3 2 1.

And ... **every number is put together
above one.**



Al-Khwarizmi did not mention zero and did not consider one a number.

Al-Khwarizmi (c. 780-850)

... **one** is the root of all number and **is outside number**.

It is the root of number because every number is found by it.

But it [one] is outside number because it is found by itself, I mean, without any other number.

Al-Uqlidisi (c. 920-980)



**Al-Uqlidisi considered
zero a placeholder,
not a number.**



Al-Uqlidisi considered zero an empty placeholder, not a number.

Al-Uqlidisi (c. 920-980)

One question is: **Why are the Hindi letters nine**, no more, no less? We say: Because the beginning of numbers from which they start is one and the last unit we pronounce is nine. Thus when we say units we mean something between one and nine; after that units are over, and ten comes out like one and takes its form. We add up ten to ten until we reach 90 which conforms with nine. Tens are now over and we say one hundred, coming back to one, and going up to 9. Thus we see that all places start with one and end with nine. That is why they are made nine. **So much for the nine letters.** If it is said: Why is zero multiplied by zero equal to zero and zero multiplied by any letter zero? We say that by multiplying zero by **zero the aim is only to occupy the place**; the same applies for multiplying the letter by zero. **We multiply the letter by zero only once, the first time, by the first letter in the upper, to occupy the place, and tell that there is a place and that it is empty.**



200 years after Brahmagupta,
al-Khwārizmī did not accept 1 as a
number. Zero as a number? Never!



200 years after Brahmagupta,
al-Khwārizmī did not accept 1 as a
number. Zero as a number? Never!



300 years after Brahmagupta,
al-Uqlīdisī accepted India's **ZERO** as a
placeholder, yet not a number. Why?



Al-Uqlīdisī means 'the Euclidist'. He was known for his skill in studying the Greek geometry of Euclid and translating it into Arabic.



Al-Uqlīdisī means 'the Euclidist'. He was known for his skill in studying the Greek geometry of Euclid and translating it into Arabic.

Around 300 BCE, Euclid defined 'number' as *a multitude of units*. So Euclid's definition of number came before 0 and 1 were numbers.

India defined zero as the sum of opposing negative and positive numbers / quantities with the same multitude or magnitude.

India defined zero as the sum of opposing negative and positive numbers / quantities with the same multitude or magnitude.

If Arabic and European writers in medieval times *really* understood India's zero, where are all the negative numbers in their writings?

“I have read a few dozen medieval Arabic books on arithmetic and algebra, and there is no hint of negative numbers in any of them. Zero, too, was not regarded to be a number, but was merely the place holder for an empty place in the representation of a number in Arabic (Indian) notation.”

**By email courtesy of Dr. Jeffrey Oaks, Professor of Mathematics
Medieval Arabic algebra and the mathematics of Greece and medieval Europe UINDY**

“I have read a few dozen medieval Arabic books on arithmetic and algebra, and there is no hint of negative numbers in any of them. Zero, too, was not regarded to be a number, but was merely the place holder for an empty place in the representation of a number in Arabic (Indian) notation.”

“All numbers in Arabic arithmetic were positive. No Arabic author to my knowledge ever even contemplated the existence of negative numbers.”

**By email courtesy of Dr. Jeffrey Oaks, Professor of Mathematics
Medieval Arabic algebra and the mathematics of Greece and medieval Europe UINDY**

The maths MYTHS we know

India's definition of zero as a number and Integer arithmetic was **[NOT]** embraced by the Arabic world

The maths MYTHS we know

India's definition of zero as a number and Integer arithmetic was [NOT] embraced by the Arabic world

Al-Khwarizmi wrote a book on Hindu Integer arithmetic which [DID NOT] feature Brahmagupta's ancient laws of sign for negatives and positives

The maths MYTHS we know

Based on what he learned from the Indians,
al-Khwarizmi then wrote a book on algebra **[NO]**

The maths MYTHS we know

Comparing al-Khwārizmī's approach to Brahmagupta's,
Rashed, Roshdi. (2009) *The Beginnings of Algebra*. Saqi, London.

The maths MYTHS we know

Comparing al-Khwārizmī's approach to Brahmagupta's,
Rashed, Roshdi. (2009) *The Beginnings of Algebra*. Saqi, London.

“Once again al-Khwārizmī differs from Brahmagupta, this time in not employing any abbreviation. Also he avoids using “negative” numbers or simply a [larger] number subtracted from a smaller one, or from zero, whereas Brahmagupta, like other Indian mathematicians before him, does not hesitate to make use of such [negative] numbers.”

The maths MYTHS we know

“It is difficult to imagine that al-Khwārizmī, if he had read this chapter [i.e. chapter 18 of Brahmagupta’s Brāhma Sphutasiddhānta] would not have been able to profit by it, even if only to shorten the presentation of his work.”

The maths MYTHS we know

“It is difficult to imagine that al-Khwārizmī, if he had read this chapter [i.e. chapter 18 of Brahmagupta’s Brāhma Sphutasiddhānta] would not have been able to profit by it, even if only to shorten the presentation of his work.”

“The style of the mathematical reasoning that is at work in al-Khwārizmī’s algebra has nothing to do with what we encounter in the work of his (Indian) predecessors.”

**628 CE
Brahmagupta
had everything
we need today!**



628 CE
Brahmagupta
had everything
we need today!



830 CE
Al-Khwārizmī
did not have 1
as a number.

628 CE
Brahmagupta
had everything
we need today!



830 CE
Al-Khwārizmī
did not have 1
as a number.



950 CE
Al-Uqlīdisī
only had 0 as
a placeholder

628 CE
Brahmagupta
had everything
we need today!



830CE
Al-Khwārizmī
did not have 1
as a number.



950 CE
Al-Uqlīdisī
only had 0 as
a placeholder

Leonardo Pisano
1170 – 1250



Leonardo Pisano

628 CE

**Brahmagupta
had everything
we need today!**

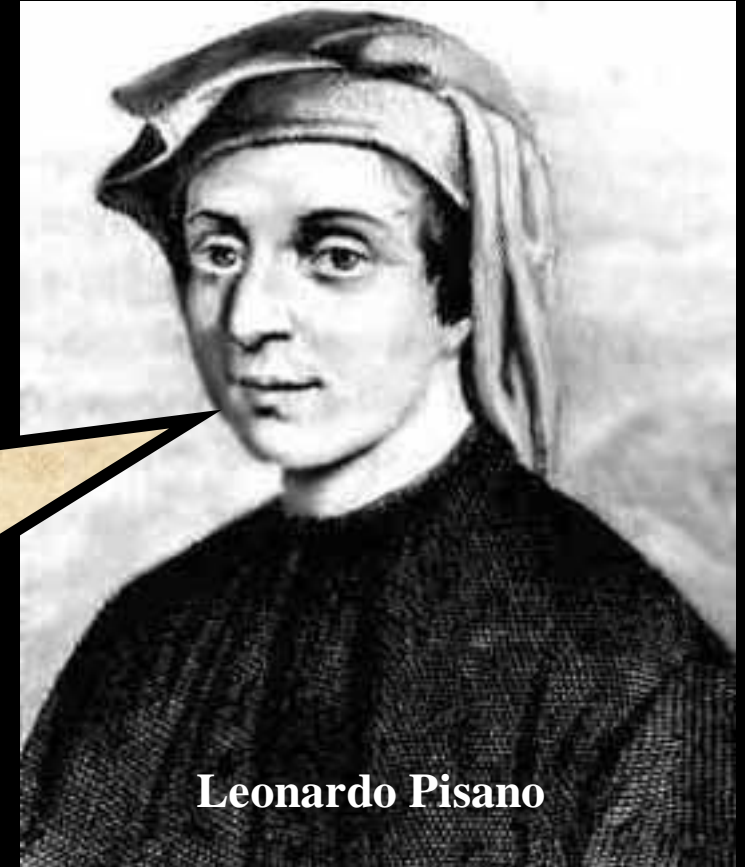


830CE
Al-Khwārizmī
did not have 1
as a number.



950 CE
Al-Uqlīdisī
only had 0 as
a placeholder

**I am Leonardo Pisano. I am the
man most responsible for
introducing India's arithmetic
into Europe in the 13th Century
via my book Liber Abaci.**



Leonardo Pisano

628 CE

**Brahmagupta
had everything
we need today!**

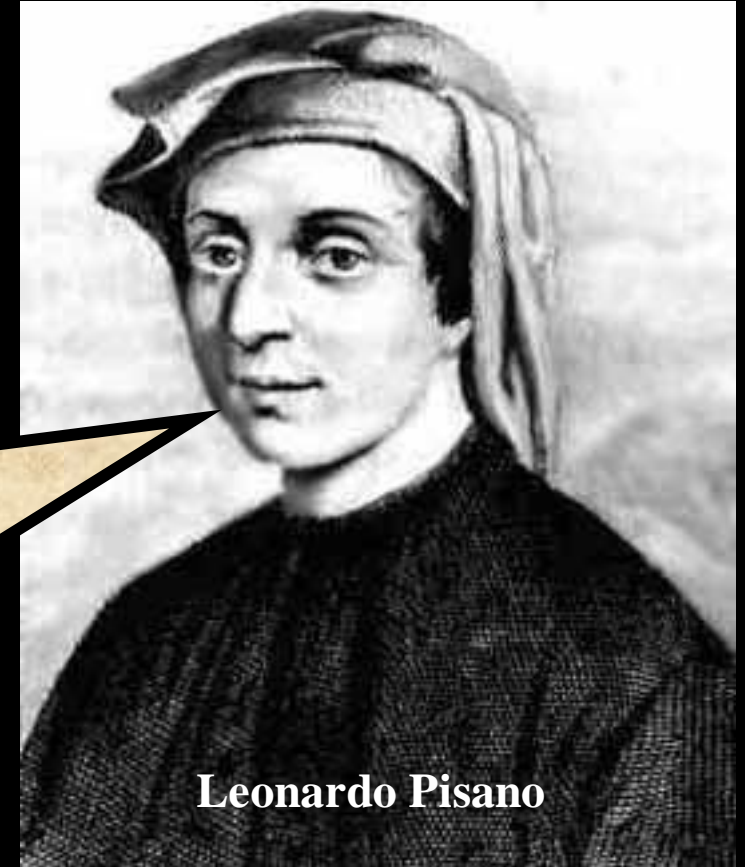


830CE
Al-Khwārizmī
did not have 1
as a number.



950 CE
Al-Uqlīdisī
only had 0 as
a placeholder

As I got my Indian info via
Arabic traders, I did **NOT** get to
learn about India's definition of
zero as a number or the rules of
positive and negatives.



Leonardo Pisano

628 CE

**Brahmagupta
had everything
we need today!**

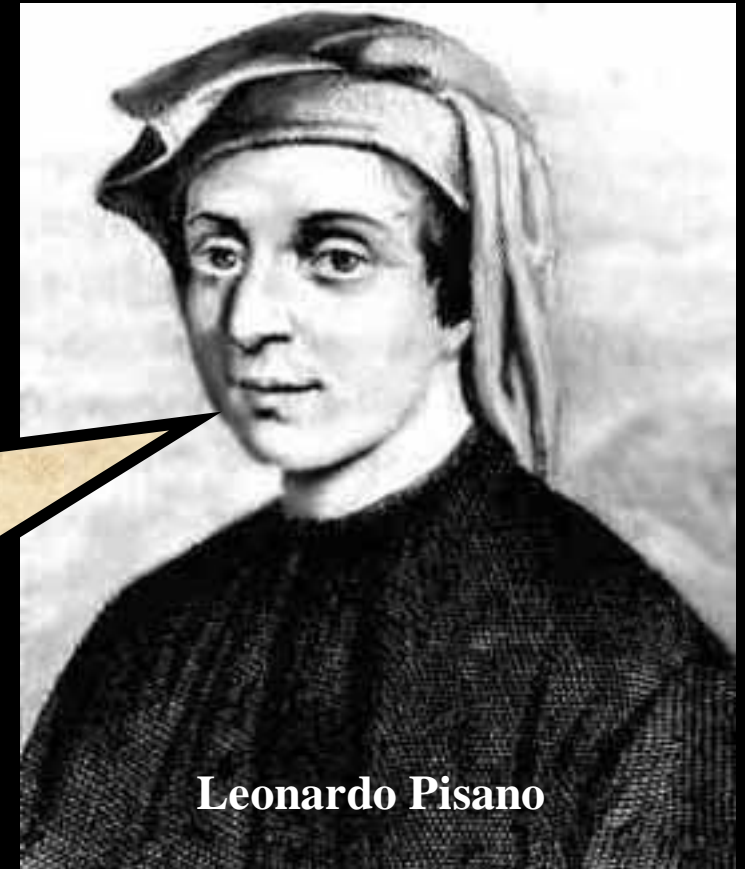


830CE
Al-Khwārizmī
did not have 1
as a number.



950 CE
Al-Uqlīdisī
only had 0 as
a placeholder

As I got my Indian info via
Arabic traders, I did **NOT** get to
learn about India's definition of
zero as a number or the rules of
positive and negatives. **Whoops!**



Leonardo Pisano



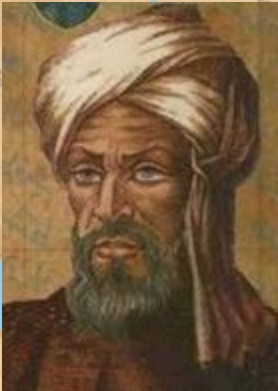
Transmission of zero
as a placeholder, yet
not as defined by
Brahmagupta 628 CE.





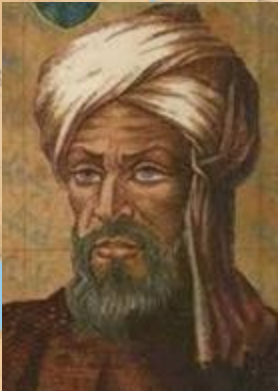
Transmission of zero as a placeholder, yet not as defined by Brahmagupta 628 CE.





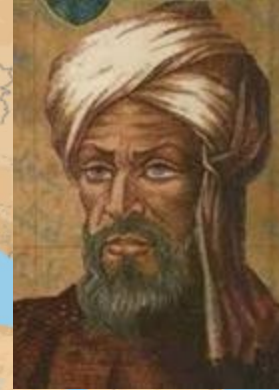
Transmission of zero as a placeholder, yet not as defined by Brahmagupta 628 CE.





Transmission of zero as a placeholder, yet not as defined by Brahmagupta 628 CE.





Transmission of zero as a placeholder, yet not as defined by Brahmagupta 628 CE.

Those unaware zero was defined as the sum of equal pos. & neg.

- Al-Khwārizmī, Iraq 9th C.
- Traders, Nth Africa 12th C.
- Leonardo Pisano, Italy 13th C.
- Robert Recorde, England 16th C.

I invented the sign = and introduced the pre-existing sign + to England.



Transmission of zero as a placeholder, yet not as defined by Brahmagupta 628 CE.

Those unaware zero was defined as the sum of equal pos. & neg.

- Al-Khwārizmī, Iraq 9th C.
- Traders, Nth Africa 12th C.
- Leonardo Pisano, Italy 13th C.
- Robert Recorde, England 16th C.

www.jonathancrabbtree.com

© 2019 J. J. Crabbtree | www.podometic.in

Map Data © 2019 Google

Yet I never knew about your zero definition Mr Brahmagupta or laws of positives & negatives

Recordes did know subtraction subtracted is addition yet that's a different idea.



Transmission of zero as a placeholder, yet not as defined by Brahmagupta 628 CE.

Those unaware zero was defined as the sum of equal pos. & neg.

- Al-Khwārizmī, Iraq 9th C.
- Traders, Nth Africa 12th C.
- Leonardo Pisano, Italy 13th C.
- Robert Recorde, England 16th C.

www.jonathancrabtree.com

© 2019 J. J. Crabtree | www.podometic.in

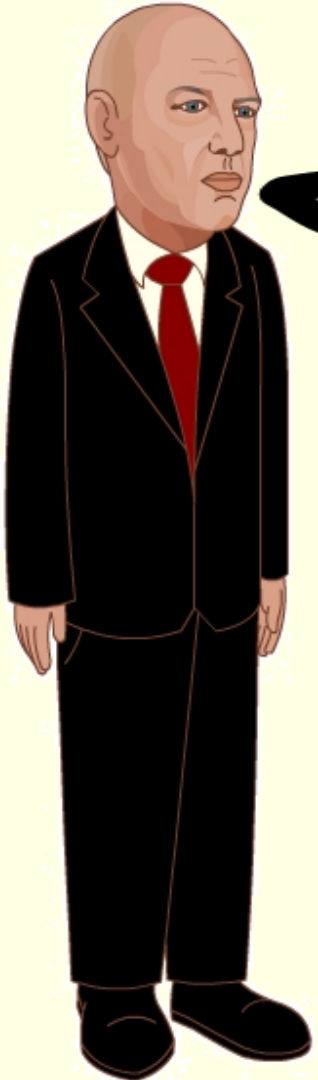
Map Data © 2019 Google



**In 1478 the first book printed
on maths (Treviso Arithmetic)
said numbers start at 2.**

**So much for 0 and 1 which is
all your computer needs!**

Download this presentation free from
www.j.mp/Maths4Modi

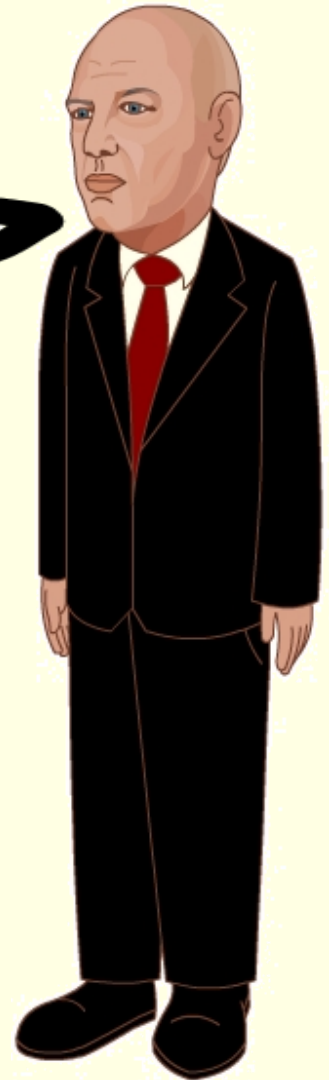


**In 16th Century England
people used Roman
Numerals and there was
no Roman Numeral for 0.**

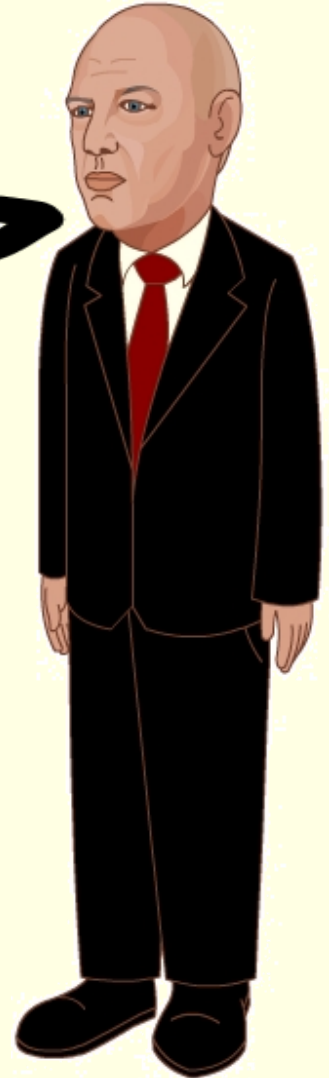


**The maths at the time
was based on Ancient
Greek maths which did
not have zero, one or
negative numbers.**

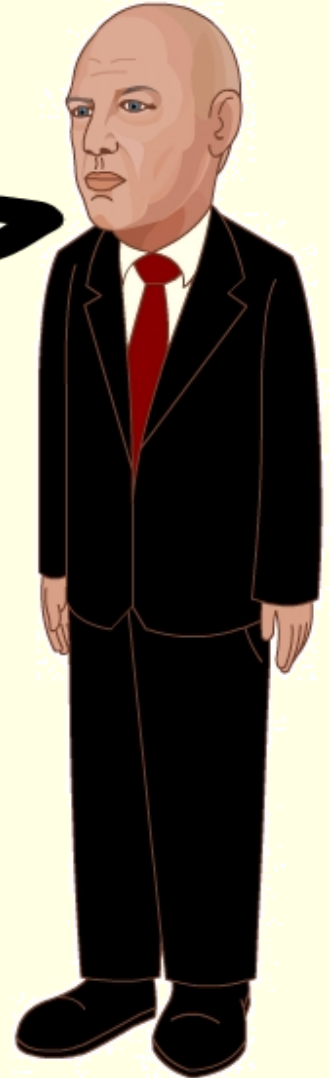
The false idea negative quantities are less than zero (rather than opposite in nature to positive quantities) emerged in Michael Stiefel's *Arithmetica Integra* of 1544 in a section titled De signis additorum & subtractorum & de numeris absurdis.



Michael Stiefel said negative numbers were below zero which is below nothing *infra 0, id est infra nihil* and negative numbers were absurd *numeri absurdi*.



To make sense of numbers that count or measure negative quantities, (i.e. negative numbers) all we need to do is drop the nonsense notion that negative quantities are 'less than zero'.



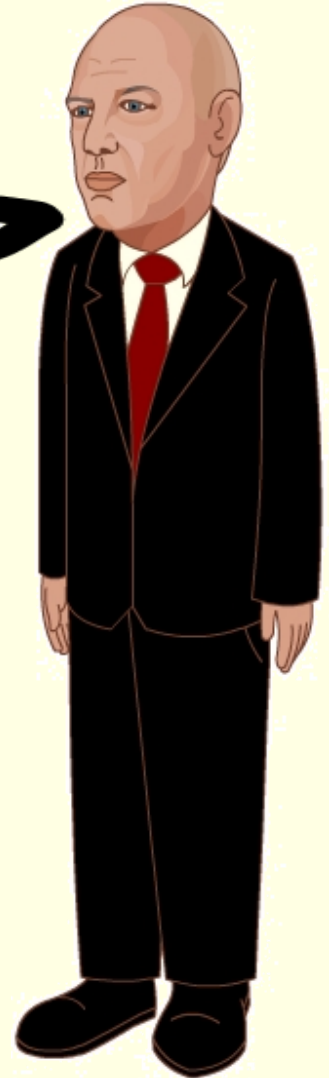
**Then negative numbers
simply count or measure
opposite quantities or
forces, which are always
greater than zero!**



**Perhaps you might recall
Newton's Third Law which
states for every action there
is an equal and opposite
reaction. Bingo!**

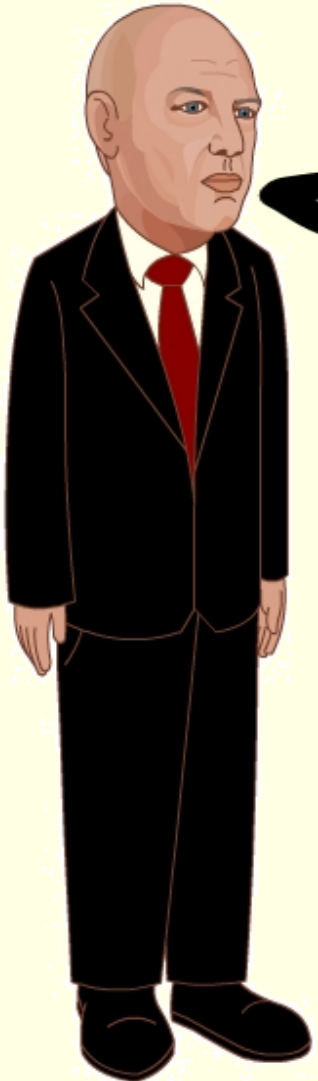


**Newton's Laws of Motion
are consistent with
Brahmagupta's laws of
quantitative mathematics,
which are also consistent
with quantum physics.**



Think about it... 3 negative electrons and 3 positive positrons are equal and opposite and cancel each other out to sum to zero.





As maths books got published in the English language, (without 0 or 1 in algorithmic definitions or as numbers) they were exported to England's settlements and colonies (e.g. New England became America).

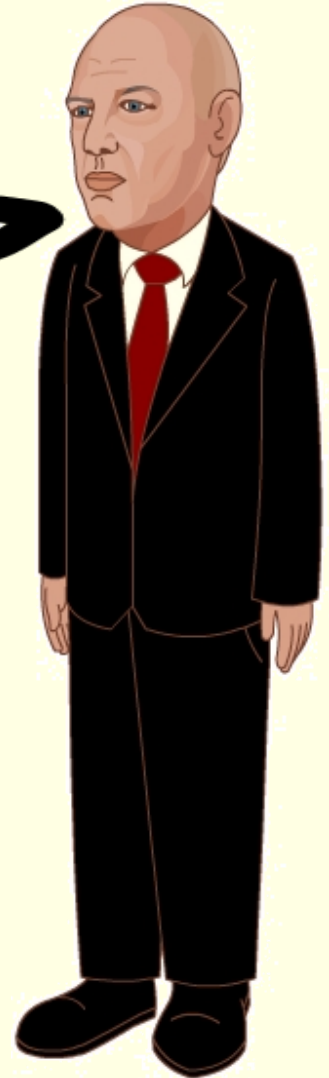


So as the English language spread, so too did **major misunderstandings** of India's mathematical foundations!

In 628 Brahmagupta gave solutions to equations we'd write today as $x^2 - 92y^2 = 1$ and $ax^2 + bx + c = 0$.



However, the first person to say 1 was a number in the West was Simon Stevin in 1585, almost 1000 years after Brahmagupta!



However, the first person to say 1 was a number in the West was Simon Stevin in 1585, almost 1000 years after Brahmagupta! **So, where is zero today?**







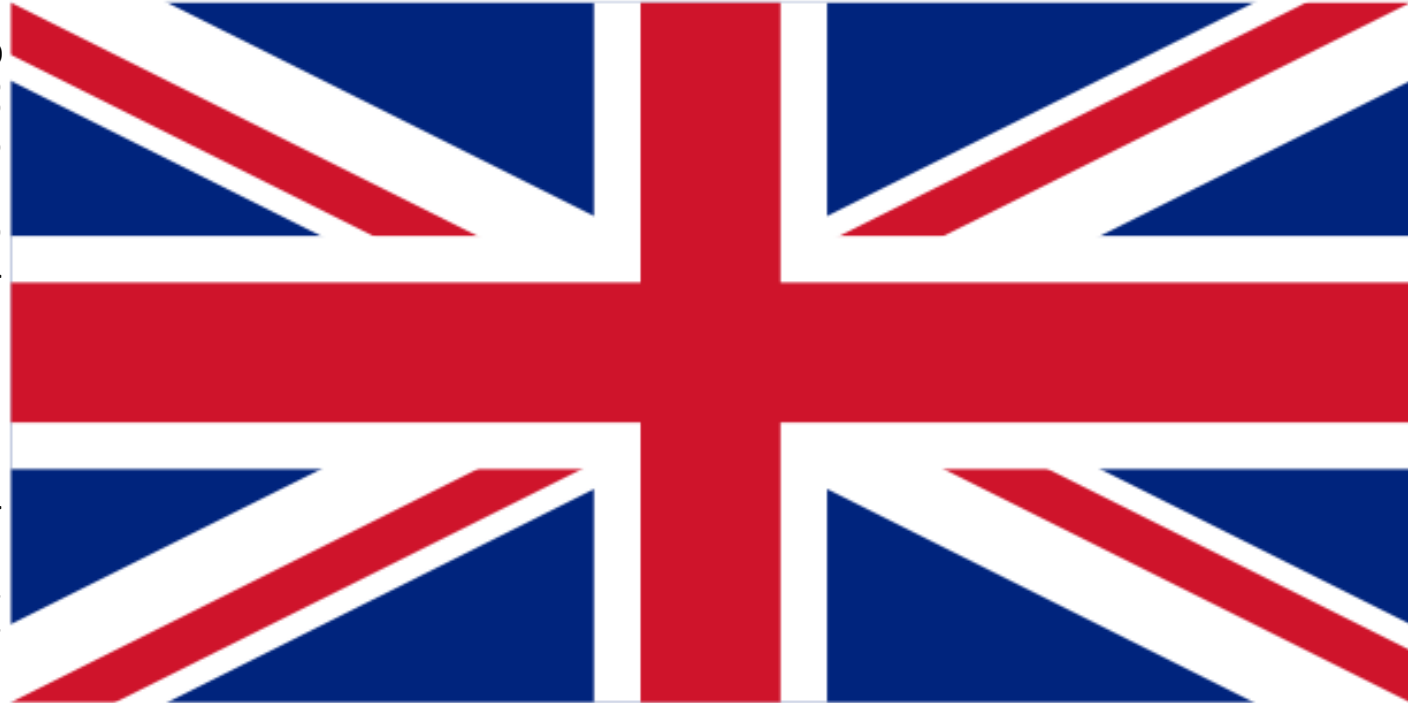
The evidence is overwhelming

Mathematical Foundations?




TRUE!

© 2019 J. J. Crabtree www.podometic.in




FALSE!


JJC ASSESSMENT OF THE WORLD'S PEDAGOGICAL EVOLUTION (628 to Now)

$^{+}12 + ^{+}4$	$^{+}12 + ^{-}4$	$^{-}12 + ^{+}4$	$^{-}12 + ^{-}4$
$^{+}12 - ^{+}4$	$^{+}12 - ^{-}4$	$^{-}12 - ^{+}4$	$^{-}12 - ^{-}4$
$^{+}12 \times ^{+}4$	$^{+}12 \times ^{-}4$	$^{-}12 \times ^{+}4$	$^{-}12 \times ^{-}4$
$^{+}12 \div ^{+}4$	$^{+}12 \div ^{-}4$	$^{-}12 \div ^{+}4$	$^{-}12 \div ^{-}4$
	PASS	FAIL	Absent

Podometric set to replace Arithmetic Dec. 2020

$+12 + +4$	$+12 + -4$	$-12 + +4$	$-12 + -4$
$+12 - +4$	$+12 - -4$	$-12 - +4$	$-12 - -4$
$+12 \times +4$	$+12 \times -4$	$-12 \times +4$	-12×-4
$+12 \div +4$	$+12 \div -4$	$-12 \div +4$	$-12 \div -4$
	PASS	FAIL	Absent

Podometric set to replace Arithmetic Dec. 2020 with Free maths eBooks for every Indian child

$+12 + +4$ $+12 - +4$ $+12 \times +4$ $+12 \div +4$	$+12 + -4$ $+12 - -4$ $+12 \times -4$ $+12 \div -4$	$-12 + +4$ $-12 - +4$ $-12 \times +4$ $-12 \div +4$	$-12 + -4$ $-12 - -4$ -12×-4 $-12 \div -4$
	PASS	FAIL	Absent

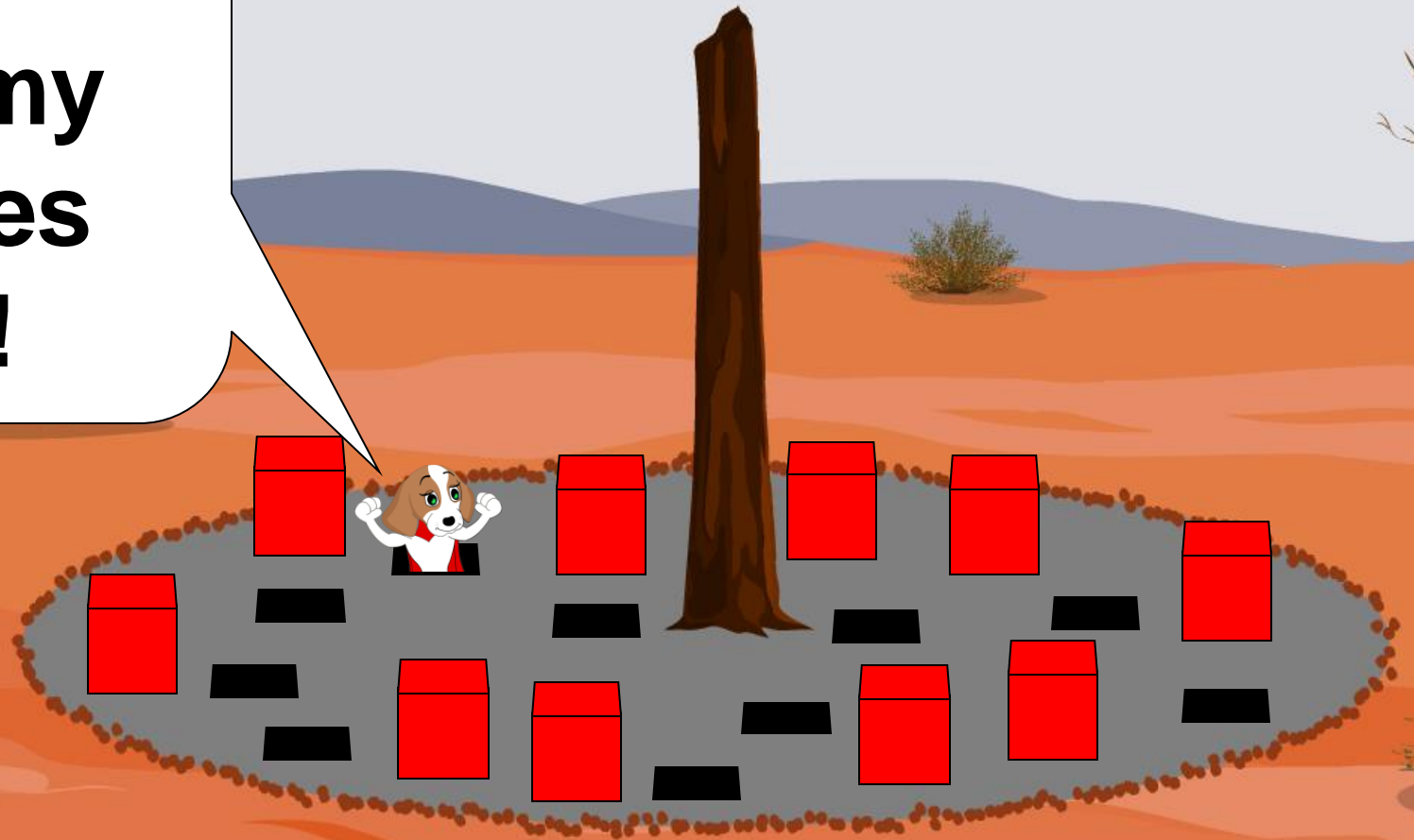
**Hey kids, play with me
and I'll make maths fun
fast and free to learn!**



Hey kids, play with me
and I'll make maths fun
fast and free to learn!
**From Class 1 on, it all
connects with the laws of
physics as well!**



**Separate, or
altogether, all my
bricks and holes
give me **zero**!**



I'm Podo the Puppy.
All my maths adventures
are being brought to life by
AFX Animation in Kolkata.
www.afxanimation.com



The hard work has been done!
India can update its
maths and prosper
or let this major maths
education advantage pass by.

HELEN ELLIOT
discovers a hidden
potential in the deeper
regions of her brain
after meeting the
memory man



TRUE
LIFE

Brain power burgeoning

Stewart, however, is not even a very mediocre teacher in his field. And it is obvious that Kirk knows what he is looking ahead. He is certainly no novice.

The women lifted cheerfully as he lifted the body. When Paul appeared again, crumpled in a vague posture in the hallway and wildly expressive in action, I noticed that he is going to Russia this morning and his late destination suffered.

"We have a break. I get something to find out the rest can give us another 10 minutes before we go to the end of the line," says the author. "The last 10 minutes of the line are the most important."

At the coffee machine I talk to a few other people, and when I want to ignore the company for serious reading, I complete a chapter. I want to try to translate her words right now and know me in a different person, a woman to whom I want to translate her words of her mind and a young woman who is not yet ready to read.

Everyone is only interested in me and Jerry, but this is a biggest indulgence. The film for the weekend and one night shows as if it might not have been all that surprising to the viewer. Although I'll never see a movie like a graduate, we have a lot more than that.

At the same time, the law is very much appreciated by



son: I have always been proud
 about my land. It has helped
 me walk, but I am beginning to
 see it in a new way. The
 mountains that we should "steer-
 steer" are becoming so we
 should see other parts of our
 land. We are starting to see
 the U. S. and the mountains
 of. There is a lot of mountains
 there, and we could see
 about 100 years of it. The
 mountains look like a lot of
 all these new things around
 mountains in my land.

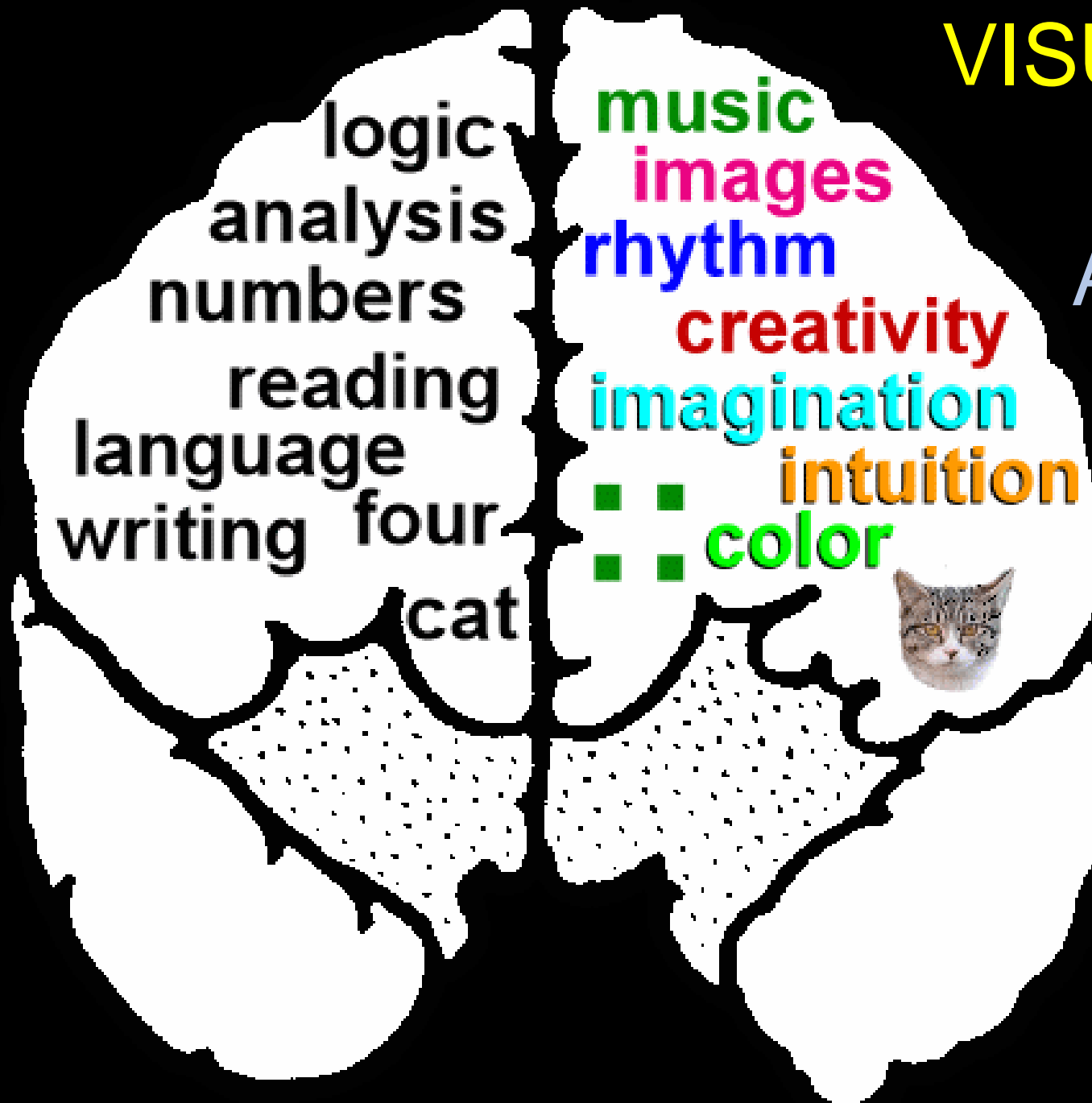
During the day we made something about fifty. The best he managed was a very good one, making four for the average amount in each column and in accuracy. He thought it would be the proof of the things when he was left alone. But he has been for the week after an accident. He thought that he might make it but he made more afterwards. He was wrong. He thought that was everything. A accident in the night.

James I. can recall at least one significant incident from after the September 11th attacks. I can recall seeing the wreckage of World Trade Center 11 on the news and how I felt sad and how the emotional experience affected me and my family.

Remember how the crowd
at Trump was all there to
sing? What the world needs
is a ballroom where, when
nothing else is around, it
is valuable and the only
left — the crowd, the
imaginary ball — that's
what it's all about. So
the logical, rational solution
is to let the world be moved

I may not have the intellectual ability of Dr. Charles Harvey, I doubt if I can overcome the linguistic barrier, but I know now that I could get my mind to it. As the way has been pointed out, I am so motivated by the principle of the cause that involved by my heart. I will be glad to do the 44 years work.

LOGICAL
SIDE



VISUAL

AUDITORY

*SRIJANI
SIDE!*

TACTILE

**KEEP
DELHI
CLEAN**





Big Problems Demand We

Think bigger

Local Legends



ANDREW MATHIESON

BURIED among the hundreds of everyday emails in Jonathan Crabtree's inbox are a few worth keeping.

Replies from Nelson Mandela, Bishop Desmond Tutu, the Dalai Lama, even Muhammad Ali are quickly printed out and put aside for safe keeping.

They are a reminder of the power behind the written word; that ordinary people can make a difference.

"I haven't got one from the President of the United States or the Pope yet," Jonathan says, "but I'll get there soon."

"The emails are not really that important - it's much more about the ideas."



Brain power: Jonathan Crabtree has endless ideas for making the world a better place.

Picture: Tommy Ritchie 40442

truck trying to beat a red light 25 years ago nearly left him dead on the road after colliding with his motorcycle.

Lying motionless on the ground, Jonathan could only remember the horizon spinning around as if he were in a plane going down.

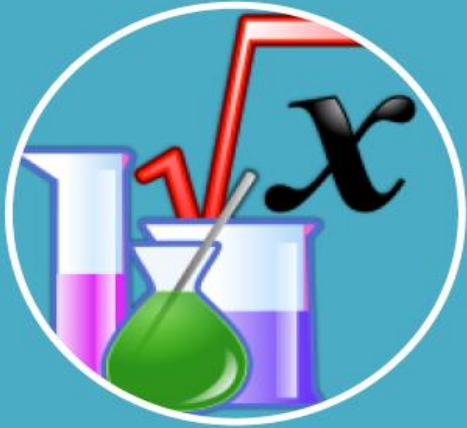
Consequently, the driver lost his licence but the

despite no formal qualifications, took up teaching mathematics from home.

"I actually failed maths," he laughs.

Throwing away the classroom text books, Jonathan taught kids to imagine algebra by closing their eyes and listening to fairytales.

Education authorities in Australia first shunned



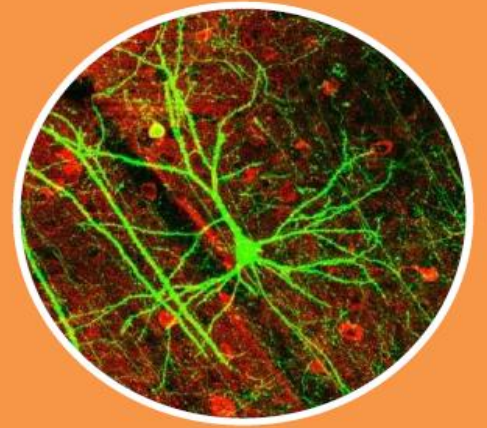
Science



Technology



Engineering



Medicine

MATHEMATICS

**India's teachers so seldom know
The trees of knowledge from seeds they sow
Past lives forgotten and the future a mystery
Making lives count, their deeds have made history**

A Seed to a View by Jonathan J. Crabtree

**So make your life count with love as your measure
Then kids will climb trees with views they will treasure.**

Thank you!

Please take a minute to sign the online petition for Bharatan Maths in India's primary classrooms @

www.change.org/Brahmagupta

Thank you!

If You Care

Please Share

www.j.mp/Maths4Modi

Thank You!

Please email me your feedback
feedback@podo.in



Jonathan J. Crabtree

Elementary Mathematics Historian

www.podometic.in

© 2019 Jonathan J. Crabtree