MATHeCADEMY.net Posters

at the 2016 MatematikBiennale in Karlstad

1-2 format A1 on the back wall

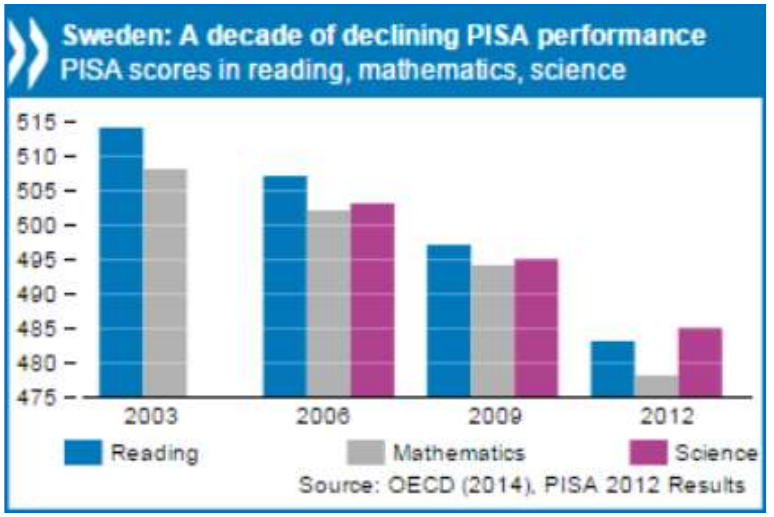
3-6 format A3 on the left wall

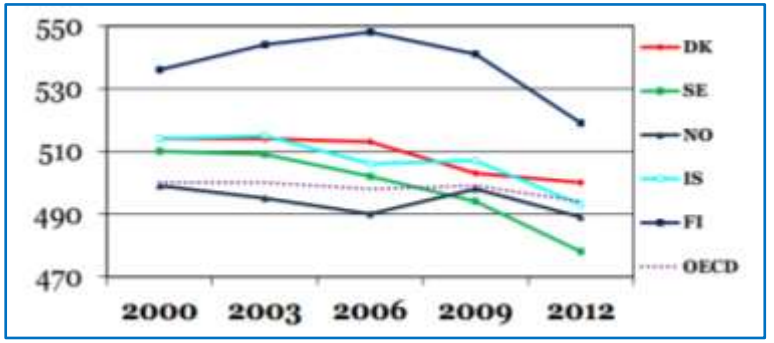
7-10 format A3 on the right wall

11-13 on the table

www.oecd.org/sweden/Sweden should urgently reform its school system to improve quality and equity

"PISA 2012, however, showed a stark decline in the performance of 15-year-old students in all three core subjects (reading, mathematics and science) during the last decade, with more than one out of four students not even achieving the baseline Level 2 in mathematics at which students begin to demonstrate competencies to actively participate in life." (page 3)





Math for NewComers & LateComers & Migrants

DysCalCulia

How to Create it

- Teach 1D LineNumbers as '8'
- No Counting before Adding
- Adding before Multiplying
- Adding without Units: 2+3=5

How to Avoid it

- Teach 2D BlockNumbers as '2 **4s**'
- Teach ReCounting before Adding
- Teach Multiplying before Adding
- Adding with Units: 2**w**+3**d**=17**d**

MATHeCADEMY.net

Teaches Teachers to Teach MatheMatics as ManyMatics, a Natural Science about Many

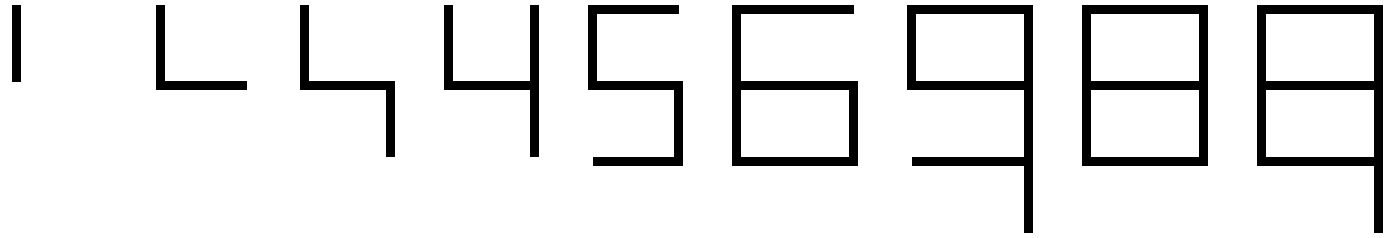
1Day Skype Seminar

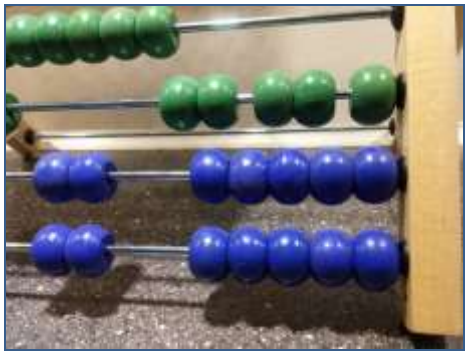
BeforeNoon: Hear 'Good & Bad & Evil Math'
AfterNoon: Do 'ReCount - don't Add' booklet

1Year PYRAMIDeDUCATION

CATS 1, **C**ount&**A**dd in **T**ime&**S**pace Primary
CATS 2, **C**ount&**A**dd in **T**ime&**S**pace Secondary

Icons & Counting

I	II	III	IIII	V	VI	VII	VIII	VIIII	VV	VVI	VVII	fingers
												icons
01	02	03	04	05	06	07	08	09	B	1B1	1B2	tens
.1	.2	.3	.4	.5	.6	.7	.8	.9	1.	1.1	1.2	tens
.1	.2	.3	.4	B	1B1	1B1	1B1	1B1	2B	2B1	2B2	5s



ReCounting

IIIII IIIII IIIII

3 **5s** = ? **7s**

3 **5s** = 2.1 **7s**

Calculator **3x5/7** **2.**some

Prediction **3x5 – 2x7** **1**

7 = IIIIIII = III III I = 2)1 **3s** = 2.1 **3s**	CupWriting & DecimalWriting
7 = 2.1 **3s** = 1.4 **3s** = 3.-2 **3s**	Overload & Deficit

CupWrite

x	7x 48 = 7x 4)8 = 28)56 = 33)6 = 336
/	336 /7 = 33)6 /7 = 28)56 /7 = 4)8 = 48
–	65 – 27 = 6)5 – 2)7 = 4)-2 = 3)8 = 38
–	65 – 27 = 5)15 – 2)7 = 3)8 = 38
+	65 + 27 = 6)5 + 2)7 = 8)12 = 9)2 = 92

Help Reform Schools in Sweden

Me

- Try out the 'ReCount – don't Add' Booklet

My Group

- Try the 1day Skype seminar 'Avoid DysCalCulia'

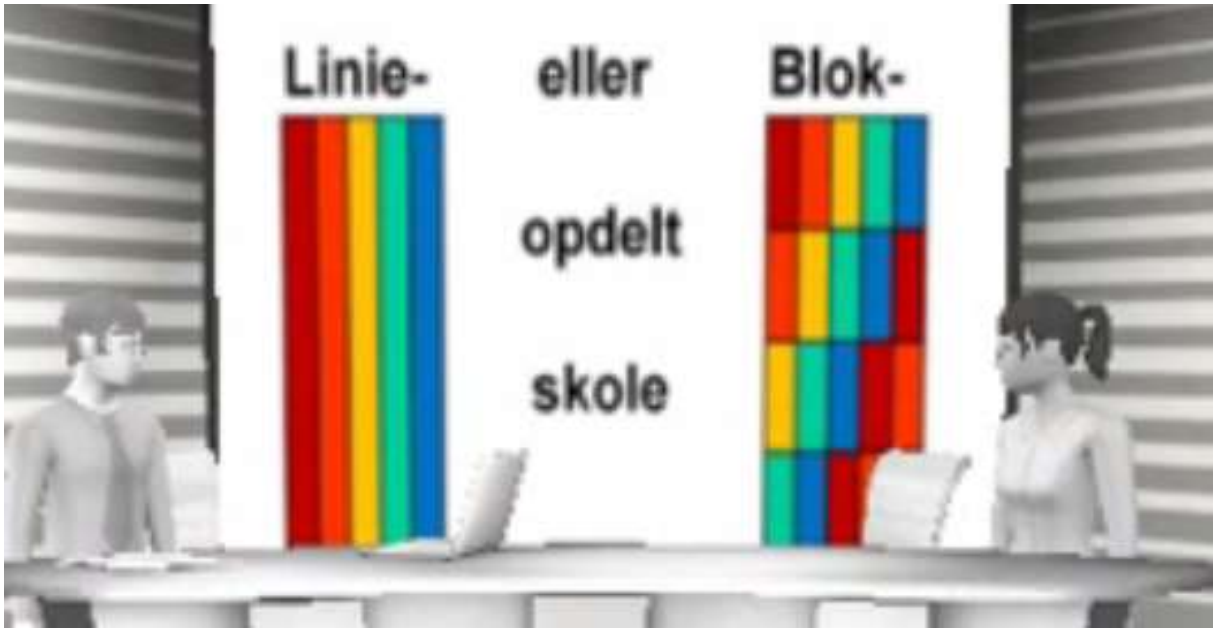
My School

- Take a 1year PYRAMIDeDUCATION in ManyMatics
- Drop MetaMatism = MetaMatics + MatheMatism

MetaMatics is presenting concepts as examples, not as abstractions
MatheMatism is true inside, but seldom outside classrooms

My country:

- ByeBye to Vygotsky and the Napoleon **LineOrganized** education leading to an office in the public/private sector
- Welcome to Piaget and the republic's **BlockOrganized** education uncovering and developing individual talents

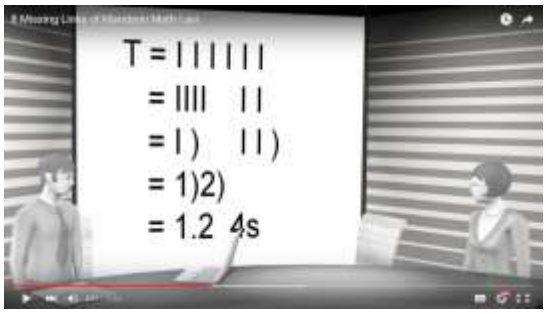


MrAlTarp: youtube.com/watch? v=zQNn1nCOuss

MATHeCADEMY.net teaches teachers to teach MatheMatics as ManyMatics, a Natural Science about MANY

Good & Bad & Evil MatheMatics

Bad MatheMatics Restricted **MatheMatism**	*True inside, but seldom outside class* Adding numbers without units 2+3 = 5, but 2 weeks + 3 days = 17 days Adding fractions without units 1/2 + 2/3 = 7/6, but 1/2 of 2 cokes + 2/3 of 3 cokes is 3/5 of 5 cokes, not 7 of 6
Evil MatheMatics Selfreferring TopDown **MetaMatics**	*A concept: an example of an abstraction, not an abstraction from many examples* A fraction is an equivalence class in a set-product A function is a relation in a set-product An equation is an equivalence statement Differential before Integral calculus
Good MatheMatics Grounded BottomUp **ManyMatics**	*A natural science about Many* To master Many ●we Iconize ●we use 2D BlockNumbers described by CupWriting & DecimalNumbers with units ●we ReCount to change units or to create an overload or a deficit ●we add NexTo and OnTop and reverse it



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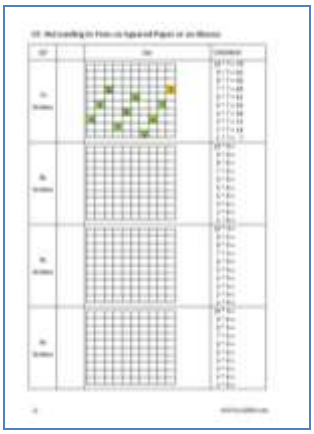
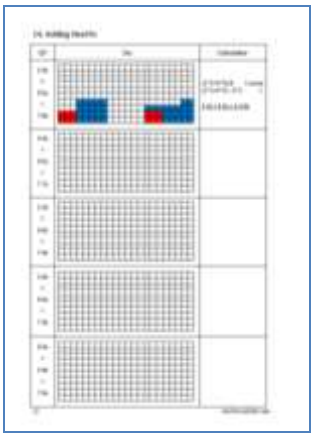
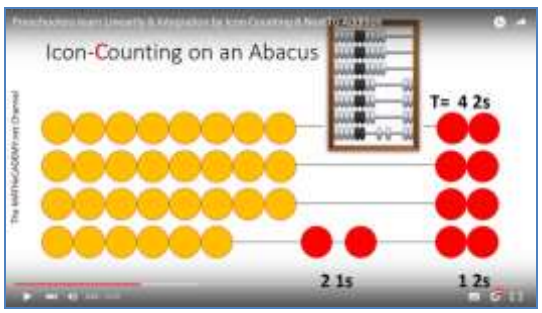
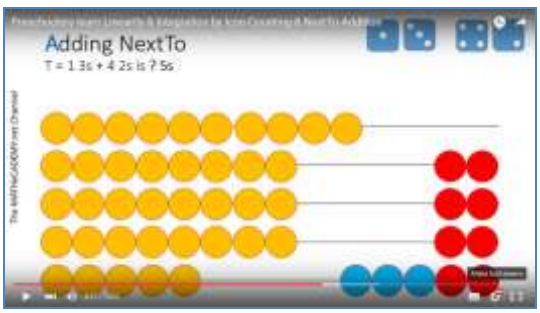
'ReCount – don't Add' Booklet

Contents





MrAlTarp: youtube.com/watch?v=R2PQJG3WSQY

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Avoid DysCalCulia: ReCount - don't Add

1Day Skype Seminar on ReCounting & CupWriting

Action Learning on the child's own 2D NumberLanguage as observed when showing 4 fingers together 2 by 2 makes a 3-year-old child say 'No, that is not 4, that is 2 2s.'

Teaching and researching 2D 'Arabic' Numbers as 1D 'Roman' Numbers may create Dyscalculia.

09-11: *Listening and Discussing*: Good & Bad & Evil Mathematics
To master Many, we Math?? No, we Count and Add. Math is a label, not an action word.

Bad Math: *MatheMatism* true inside but rarely outside classes: 2+3 IS 5, but 2w+3d = 17d? *Adding 1D Line Numbers without units may add to creating Dyscalculia.*
Evil Math: *MetaMatics* presents a concept TopDown as an example of an abstraction, not BottomUp as an abstraction from many examples: A fraction IS an example of a set-product.
Good Math: *ManyMatics*, a natural science Many mastering Many by ReCounting & CupWriting:
T = IIIIIII = III III I = II) I = 2)1 = 2.1 3s.

Block Numbers as a hidden alternative to the Traditional cardinal Line Numbers
To Count Many, we Bundle & Stack, so a total T is a 2D block where numbers have units:
T = 345 = 3 BundleBundles + 4 Bundles + 5 Singles = 3*BB + 4*B + 5*1.
In T = 2 3s, 2 is a Counting Number (an operator), and 3 is a Bundle, or Unit Number.
Counting Numbers add if the units are the same. Unit Numbers do not add.
The Tradition only accepts linear Cardinal Numbers, being added without units.

11-13: Skype Conference. Lunch

13-15: *Doing*: The 'ReCount – don't Add' booklet shows how proportionality & calculus & solving equations are golden LearningOpportunities in ReCounting and NextTo Addition.

RECOUNTING, in the same unit creates overload or deficit, in a new unit *proportionality*
Question: T = 2.1 3s = ? 3s. **Answer**: T = 2.1 = 2)1 = 1)4 = 3)-2 3s
Q: T = 2 3s = ? 4s **A**: T = 2 3s = III III = IIII II = 1)2 4s = 1)1 5s = 3) 2s = 1)1) 2s = 11.0 2s
CalculatorPrediction. **Q**: T = 2 4s = ? 5s. **A**: T = 1.3 5s since
RecountFormula **T = (T/B)*B** says 'From T, T/B times, Bs can be taken away'

2*4/5	**1.some**
2*4 - 1*5	**3**

RECOUNTING in Tens and from Tens means teaching *multiplication before addition*:
Q: T= 3 7s = ? tens. **A**: T= 3*7 = 21 = 2.1 tens. **Q**: T= 47 = ? 6s. **A**: T= (47/6)*6 = 7 6s & 5
DoubleCounting in two units creates **PerNumbers**
Q: T = 10$ = ?kg with 4$ per 5kg. **A**: T = 10$ = (10/4) * 4$ = (10/4) * 5 kg = 12.5 kg

ADD OnTop. **Q**: T = 2 4s + 3 5s = ? 5s. **A**: T = 1.3 5s + 3 5s = 1)3 + 3) = 4)3 = 4.3 5s

ADD NextTo. **Q**: T = 2 4s + 3 5s = ? 9s. **A**: T = 2.5 9s (*integration*)

Multiply & Divide & Subtract & Add with **CupWriting** create and remove overloads
Q: T = 7 * 463 = ? **A**: T = 7 * 4)6)3 = 28)42)21 = 28)44)1 = 32)4)1 = 3241
Q: T = 3241 / 7 = ? **A**: T = 32)4)1 / 7 = 28)44)1 / 7 = 28)42)21 / 7 = 4)6)3 = 463
Q: T = 57 – 18 = ? **A**: T = 5)7 – 1)8 = 4)-1 = 3)9 = 39
Q: T = 57 + 18 = ? **A**: T = 5)7 + 1)8 = 6)15 = 7)5 = 75

15-16: Coffee. Skype Conference

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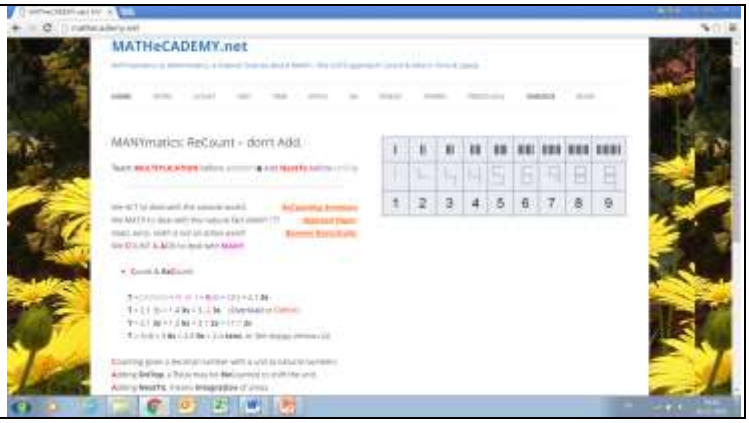
MATHeCADEMY.net

OnLine TeacherTraining to TurnAround PISA Scores

The CATS Method & PYRAMIDeDUCATION

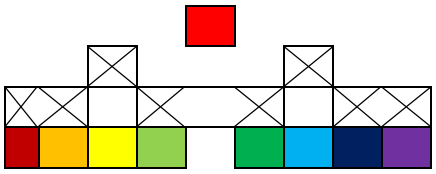
Teaching Teachers to Teach
MatheMatics as ManyMatics
a Natural Science
about Many



To deal with MANY, we Count & Add in Time & Space.
So the learner is educated by the physical fact Many, not by books.

Primary school mathematics is learned through educational sentence-free meetings with the sentence subject developing tacit competences and individual sentences coming from abstractions and validations in the laboratory, i.e. through automatic 'grasp-to-grasp' learning.	Secondary school mathematics is learned through educational sentence-loaded tales abstracted from and validated in the laboratory, i.e. through automatic 'gossip-learning': "Thank you for telling me a thing I don't know about a thing I know."

In PYRAMIDeDUCATION 8 teachers form 2 teams choosing 3 pairs and 2 instructors by turn. Instructing the rest of their team the instructors consult the coach. Each pair works together to solve Count&Add tasks and routine problems; and to carry out an educational task to be reported in an essay rich on observations of examples of cognition, both recognition and new cognition, i.e. both assimilation and accommodation.

The coach assists the instructors in correcting the Count& Add tasks. In each pair each teacher corrects the other teacher's routine-task. Each pair is the opponent on the essay of another pair. Each teacher pays for the education by coaching a new group of 8 teachers.	1 coach 2 instructors 3 pairs 2 teams  *8 teachers and 1 coach*

The MATHeCADEMY.net Channel

on YouTube & facebook

MATHeCADEMY.net teaches teachers to teach MatheMatics as ManyMatics, a Natural Science about MANY

MATHeCADEMY.net - Summary

OnLine InService TeacherTraining

The CATS Method & PYRAMIDeDUCATION

	QUESTIONS	ANSWERS
C1 COUNT	How to count Many? How to recount 8 in 3s: T= 8 = ? 3s How to recount 6kg in $: T=6kg=?$ How to count in standard bundles?	By bundling and stacking the total T predicted by T = (T/b)*b T = 8 = ?*3 = ?3s, T = 8 = (8/3)*3 = 2*3 +2 = 2*3 +2/3*3 = 2 2/3*3 If 4kg = 2$ then 6kg = (6/4)*4kg = (6/4)*2$ = 3$ Bundling bundles gives a multiple stack, a stock or polynomial: T = 423 = 4BundleBundle+2Bundle+3 = 4tenten2ten3 = 4*B^2+2*B+3
C2 COUNT	How can we count possibilities? How can we predict unpredictable numbers?	By using the numbers in Pascal's triangle We 'post-dict' that the average number is 8.2 with the deviation 2.3. We 'pre-dict' that the next number, with 95% probability, will fall in the confidence interval 8.2 ± 4.6 (average ± 2*deviation)
A1 ADD	How to add stacks concretely? T=27+16= 2ten7+1ten6= 3ten13=? How to add stacks abstractly?	By restacking overloads predicted by the restack-equation T = (T-b)+b T = 27+16 = 2 ten 7+1 ten 6 = 3 ten 13 = 3 ten 1 ten 3 = 4 ten 3 = 43 Vertical calculation uses carrying. Horizontal calculation uses FOIL
A2 ADD	What is a prime number? What is a per-number? How to add per-numbers?	Fold-numbers can be folded: 10 = 2fold5. Prime-numbers can't: 5 = 1fold5 Per-numbers occur when counting, when pricing and when splitting. The $/day-number a is multiplied with the day-number b before added to the total $-number T: T2 = T1 + a*b
T1 TIME	How can counting & adding be reversed ? Counting ? 3s and adding 2 gave 14. Can all calculations be reversed?	By calculating backward, i.e. by moving a number to the other side of the equation sign and reversing its calculation sign. x*3+2 = 14 is reversed to x = (14-2)/3 Yes. x+a = b is reversed to x = b-a, x*a = b is reversed to x = b/a, x^a = b is reversed to x = a√b, a^x = b is reversed to x = logb/loga
T2 TIME	How to predict the terminal number when the change is constant? How to predict the terminal number when the change is variable, but predictable?	By using constant change-equations: If Ko = 30 and ΔK/n = a = 2, then K7 = Ko+a*n = 30+2*7 = 44 If Ko = 30 and ΔK/K = r = 2%, then K7 = Ko*(1+r)^n = 30*1.02^7 = 34.46 By solving a variable change-equation: If Ko = 30 and dK/dx = K', then ΔK = K-Ko = ∫K'dx
S1 SPACE	How to count plane and spatial properties of stacks and boxes and round objects?	By using a ruler, a protractor and a triangular shape. By the 3 Greek Pythagoras', mini, midi & maxi By the 3 Arabic recount-equations: sinA = a/c, cosA = b/c, tanA = a/b
S2 SPACE	How to predict the position of points and lines? How to use the new calculation technology?	By using a coordinate-system: If Po(x,y) = (3,4) and if Δy/Δx = 2, then P1(8,y) = P1(x+Δx,y+Δy) = P1((8-3)+3,4+2*(8-3)) = (8,14) Computers can calculate a set of numbers (vectors) and a set of vectors (matrices)
QL	What is quantitative literature? Does quantitative literature also have the 3 different genres: Fact, Fiction and Fiddle?	Quantitative literature tells about Many in time and space The word and the number language share genres: • Fact is a since-so calculation, or a room-calculation • Fiction is an if-then calculation, or a rate-calculation • Fiddle is a so-what calculation, or a risk-calculation

The MATHeCADEMY.net website contains 2*4 study units in 'mathematics from below, the LAB-approach', organised as lab-activities where the learner learns 'CATS', i.e. learns to Count and Add in Time and Space. The study units CATS1 are for primary school and the study units CATS2 are for secondary school. The units were developed for a web-based teacher-training course in mathematics at a Danish teacher college.

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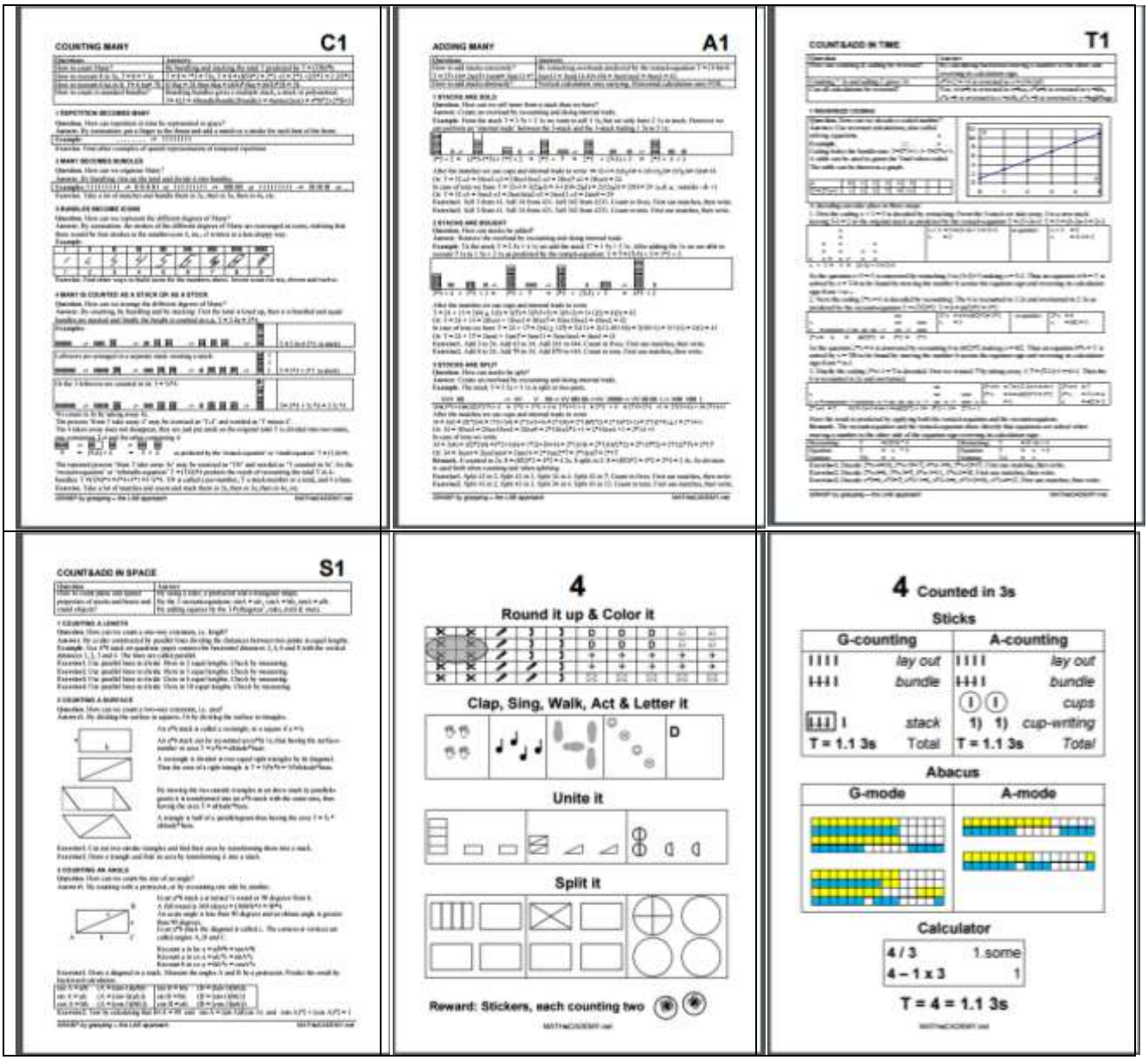
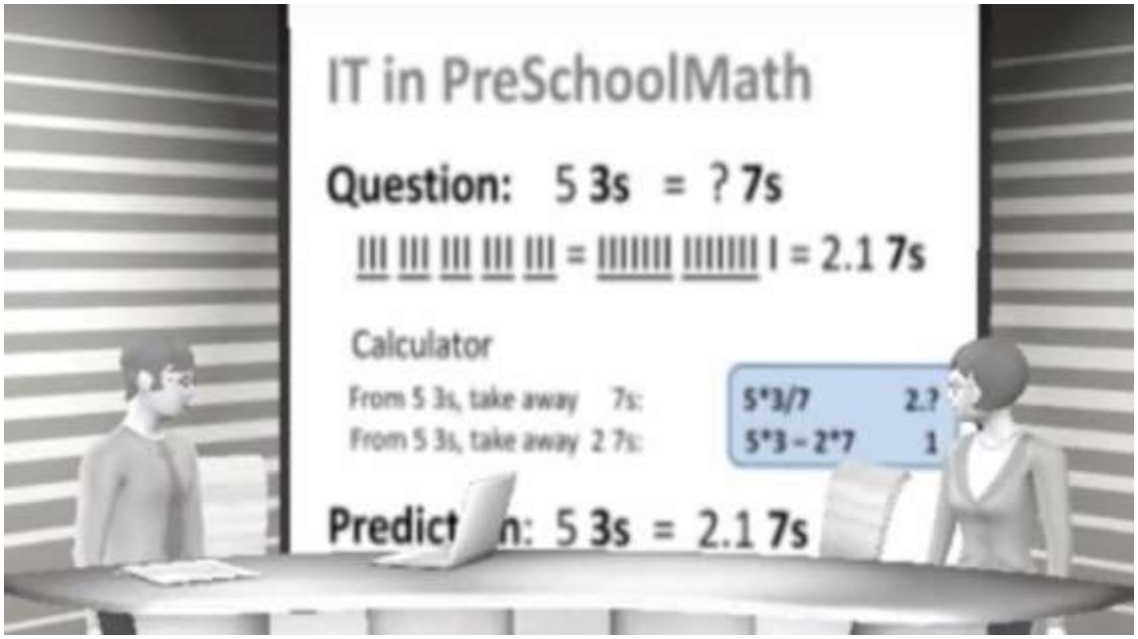
CATS Teacher Training & Action Learning/Research & MrAlTarp YouTube





MrAlTarp: youtube.com/watch?v=qgCwVZnALXA

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MatheMatics: ManyMatics or MetaMatism

MatheMatics: Grounded BottomUp from Below or Self referring TopDown from Above

Same Questions – Different Answers

	ManyMatics	MetaMatism
Digits	Icons, different from letters	Symbols like letters
Numbers	2D blocks, e.g. 2.3 tens. In 2 3s, 2 is a counting and 3 is a cardinal number. Only the first adds	1D cardinal numbers, e.g. 23. Organized as number line points. All numbers add
Operations	Icons for the counting process	Mapping a set-product to a set
Order	Divide, multiply, subtract, add	Add, subtract, multiply, divide
Teaching order	Recount, multiply, add	No counting, add, multiply
Addition	OnTop and NextTo	OnTop only
2 + 3 = 5 true by nature or by choice?	Adding numbers without units is MatheMatism, true inside but not outside class: 2w+3d = 17d	Both correct by nature. Numbers need no units to be added.
A formula	A calculation used for number prediction, e.g. by ReCounting. ReCount Formula: T = (T/B)*B ReStack Formula: T = (T-B)+B	An ex. of a function that is an ex. of a set-product relation where component1 identity implies component2 identity
Calculator	From preschool	To be postponed
Equation	Reversing an operation or reversing a formula	Two equivalent number names
Solution	Moving numbers to the opposite side with the opposite sign	Neutralizing by identical operations on both sides
PerNumbers	Come from DoubleCounting	Not accepted
Fractions	PerNumbers, operators needing a number to produce a number	Rational numbers, equivalence classes: a/b = c/d if a*d = b*c.
Add fractions	Only with units	Only with like denominators
Integration	Primary school: Next-to addition Middle/High: Adding piecewise/ locally constant per-numbers	Last year in high school, for high achieving students only
Algebra	To ReUnite constant and variable UnitNumbers and PerNumbers	A search for patterns
Concept	An abstraction from many examples	An example from an abstraction (MetaMatics)
Root of Math	The physical fact Many	The metaphysical invention Set
Mathematics	ManyMatics, a natural science about the physical fact Many	MetaMatics + MatheMatism = MetaMatism
DysCalculia	A teaching defect neglecting the child's own NumberLanguage	A cognitive or brain defect. Not installed by MetaMatism

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