

Artificial Intelligence forces us to change Maths education

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The Importance of Math

Brazil 2017





MAARIT ROSSI / FINLAND

TOP **10** FINALIST

#TeachersMatter



GLOBAL
TEACHER
PRIZE
WARKEY FOUNDATION

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Car assembly line



Learning in lines - 1950's



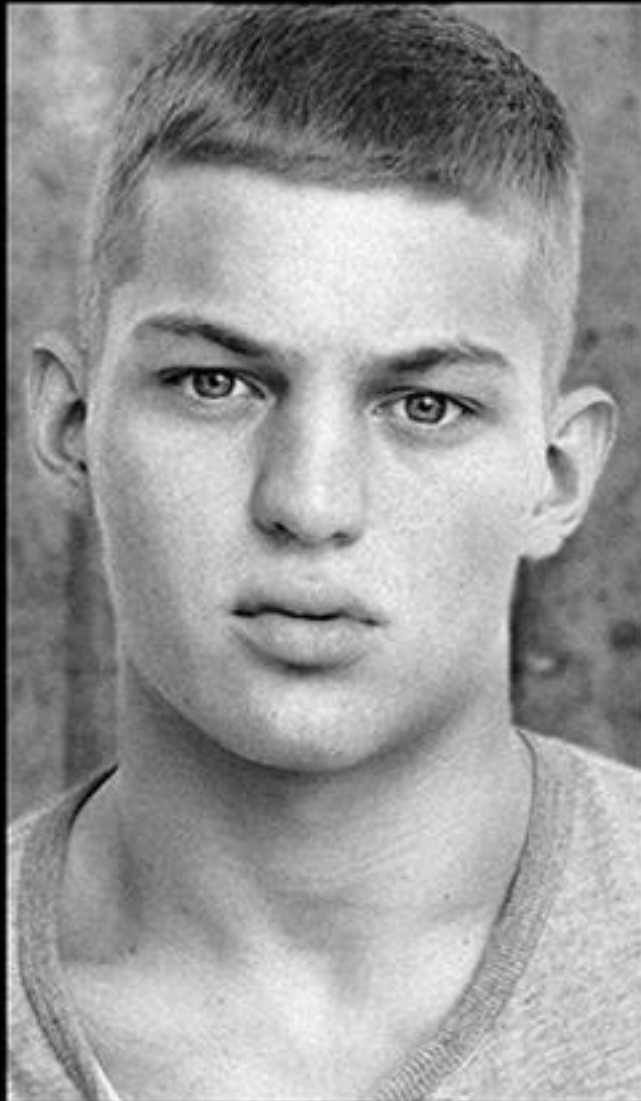
Learning in lines - 2010



Boring



Meaningless



Frightening



$$\sqrt{25} - 2^3$$

$$a^4 \cdot a^4 \cdot (-a)^2$$

$$X^2 - 16 = 0$$

$$4x - 9 = 21 - x$$

$$9(x+3) = 63$$

$$-x^5 - 3x^4 + 4x^3 = 0$$

Teaching Math has not changed in 100 years!

OECD: Ten Questions for Mathematics Teachers...and how PISA can help answer them





Machine is solving school Maths

Algebra Mathway

How can I help you?
Tap to view tutorial...

$x^2 - 2x + 4$

$x^2 - 2x + 1$ $x^2 - 2x + 4y^2$ $x^2 - 2x + 49$

() | [] $\sqrt{\quad}$ $\sqrt[3]{\quad}$ \geq $\frac{\square}{\square}$ $f(x)$ $f(x)=\{$

x 7 8 9 $\frac{\square}{\square}$ \square^{\square} \square_{\square} \leq ln e U \cap

y 4 5 6 / \wedge * $>$ log \log_{\square} i π

z 1 2 3 - + \div $<$ \square (\square) ! ∞

abc , 0 . % $_$ = $<$ $>$ \times \leftarrow

Algebra Mathway

How can I help you?
Tap to view tutorial...

$x^2 - 2x + 4$

$x^2 - 2x + 1$ $x^2 - 2x + 49$

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y 4 5 \log_{\square} i π

z 1 2 3 - + \div $<$ \square (\square) ! ∞

abc , 0 . % $_$ = $<$ $>$ \times \leftarrow

How should I answer?

- Factor
- Apply the Quadratic Formula
- Graph
- Find the Roots (Zeros)
- Find the X and Y Intercepts
- Find the Vertex
- Find the Domain and Range
- Complete the Square
- Simplify

Step by step

Algebra



Graph the parabola using the direction, vertex, focus, and axis of symmetry.

Direction: Opens Up

Vertex: $(1, 3)$

Focus: $(1, \frac{13}{4})$

Axis of Symmetry: $x = 1$

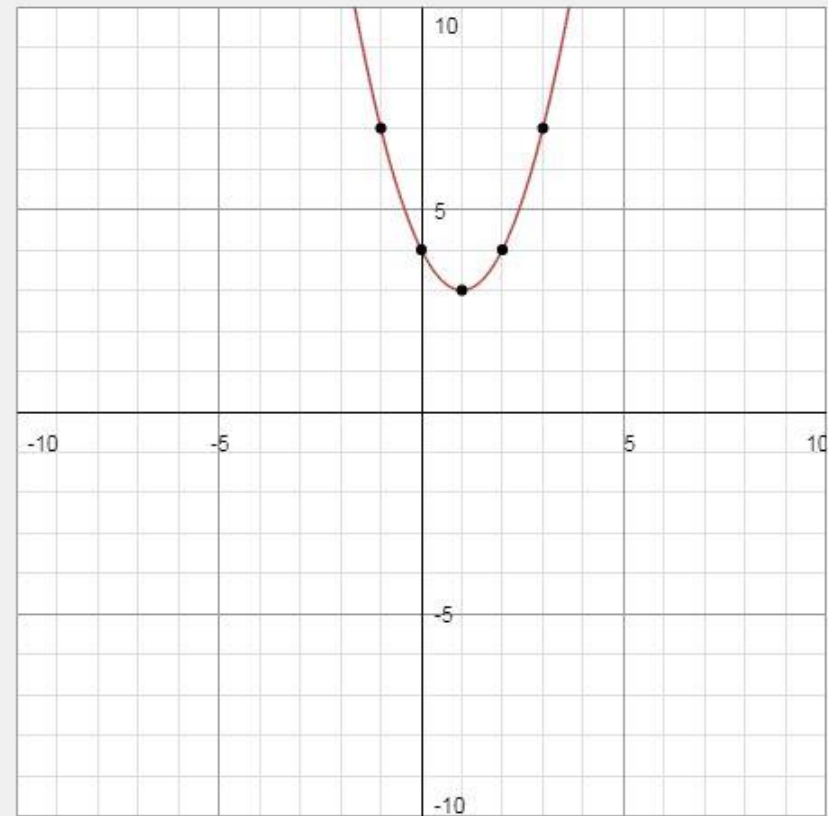
Directrix: $y = \frac{11}{4}$

x	y
-1	7
0	4
1	3
2	4
3	7

Tap to view steps...

Enter a problem

Tap to view steps...



Enter a problem

10 Skills you'll need in the workplace by 2020



- **10** Cognitive flexibility
- **9** Negotiation
- **8** Service orientation
- **7** Judgement & decision making
- **6** Emotional intelligence
- **5** Coordinating with others
- **4** People management
- **3** Creativity
- **2** Critical thinking
- **1** Complex problem solving

Modern curriculum of Mathematics

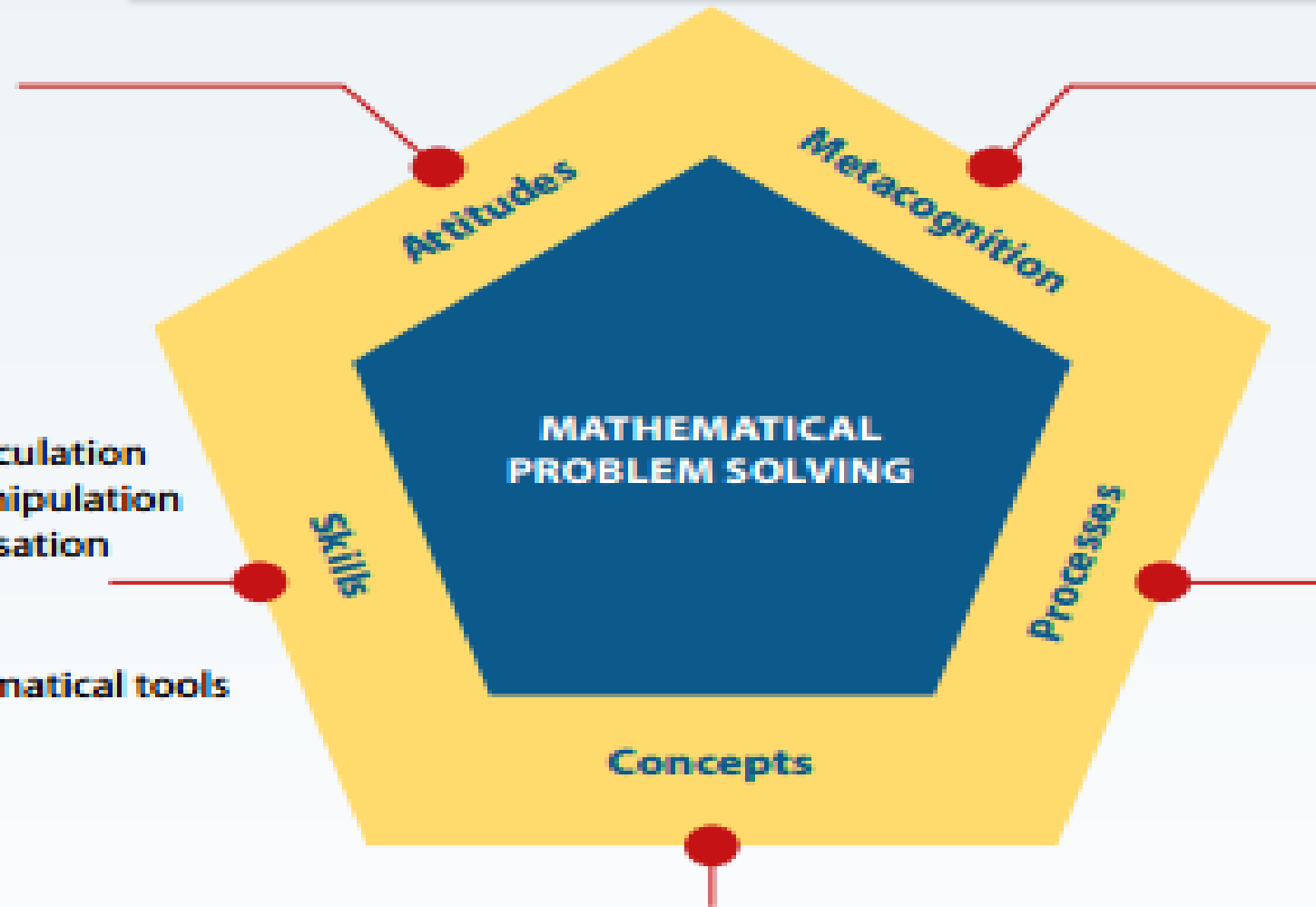
- Beliefs
- Interest
- Appreciation
- Confidence
- Perseverance

- Monitoring of one's own thinking
- Self-regulation of learning

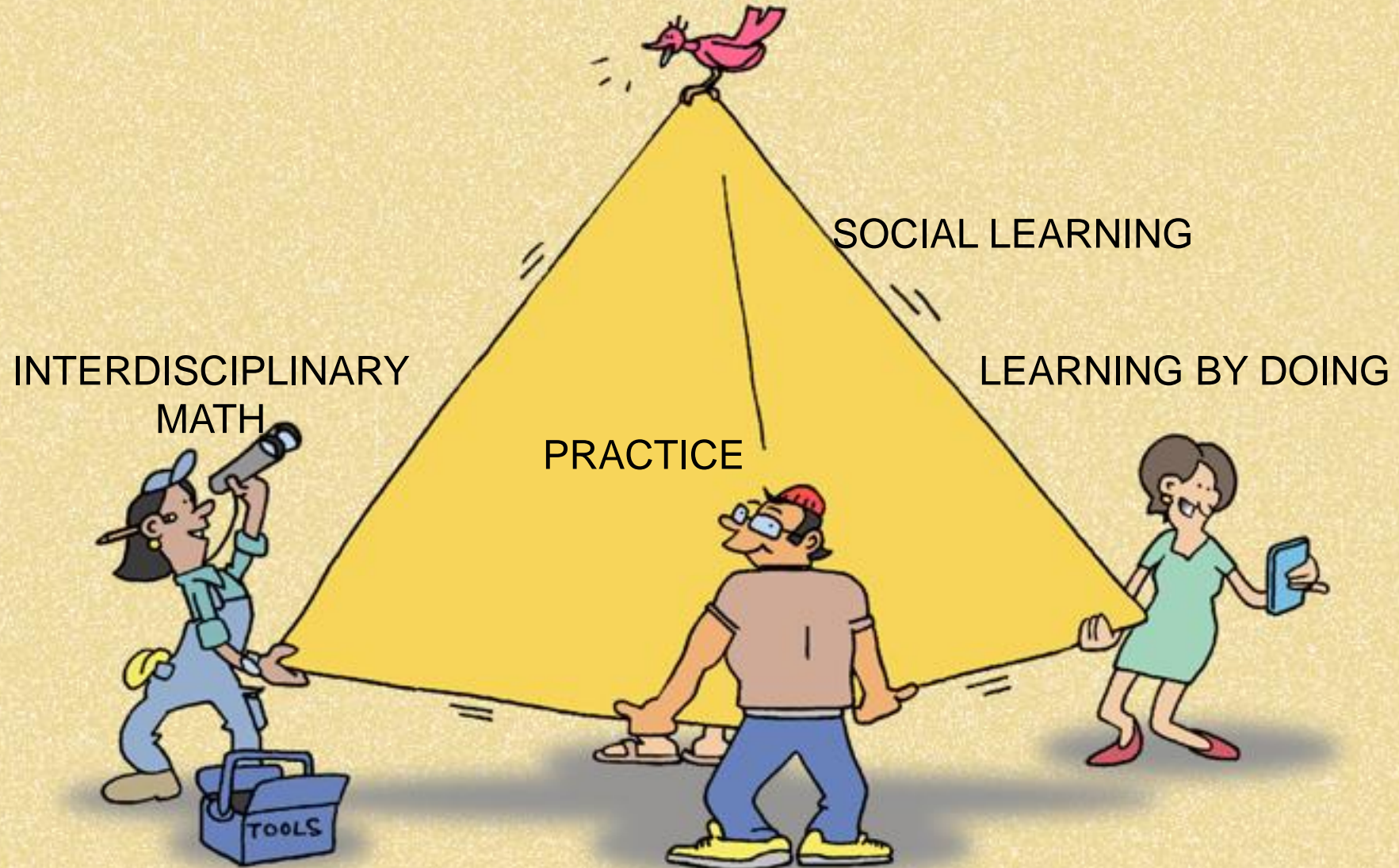
- Numerical calculation
- Algebraic manipulation
- Spatial visualisation
- Data analysis
- Measurement
- Use of mathematical tools
- Estimation

- Reasoning, communication and connections
- Applications and modelling
- Thinking skills and heuristics

- Numerical
- Algebraic
- Geometric
- Statistical
- Probabilistic
- Analytical



OUR FOUR PILLARS



Real-life problems





sade

tomaatti
tomat

1.lk Puola

1 69
kg

29
sacka

Kukkakaali
blomkål

1.lk Suomi

SÄÄSTÄ
1 49

SÄÄSTÄ
2 19

Mau
1 50

Pöytä
1 99

1 99

SÄÄSTÄ
2 49





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Real-life problems



Double lessons!

Re-arrange the classroom

Planning strategy together



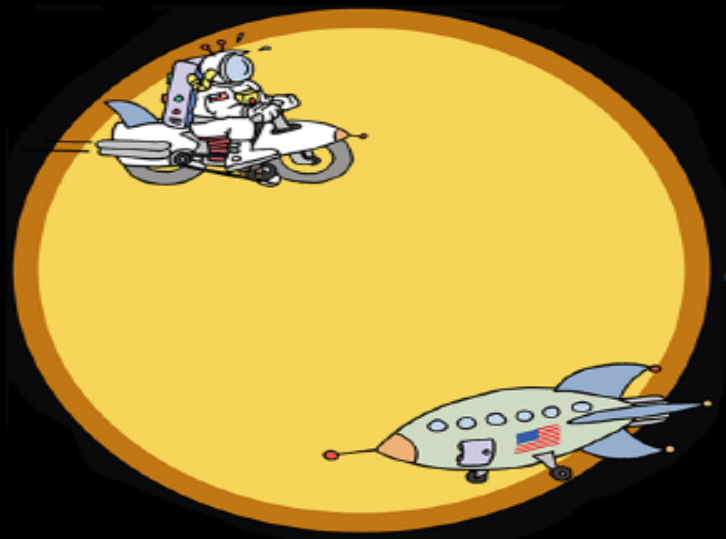
Modelling



6. OUR SOLAR SYSTEM



Place the planets on the blue line with correct distance to the Sun.
Use pinch zoom to change scale.



PLANET	AVERAGE DISTANCE FROM THE SUN (KM)
MERCURY	58,000,000
VENUS	108,000,000
EARTH	150,000,000
MARS	228,000,000
JUPITER	778,000,000
SATURN	1,430,00,000
URANUS	2,870,000,000
NEPTUNE	4,500,000,00



Modelling



Estimating and using creativity



Measuring and rounding



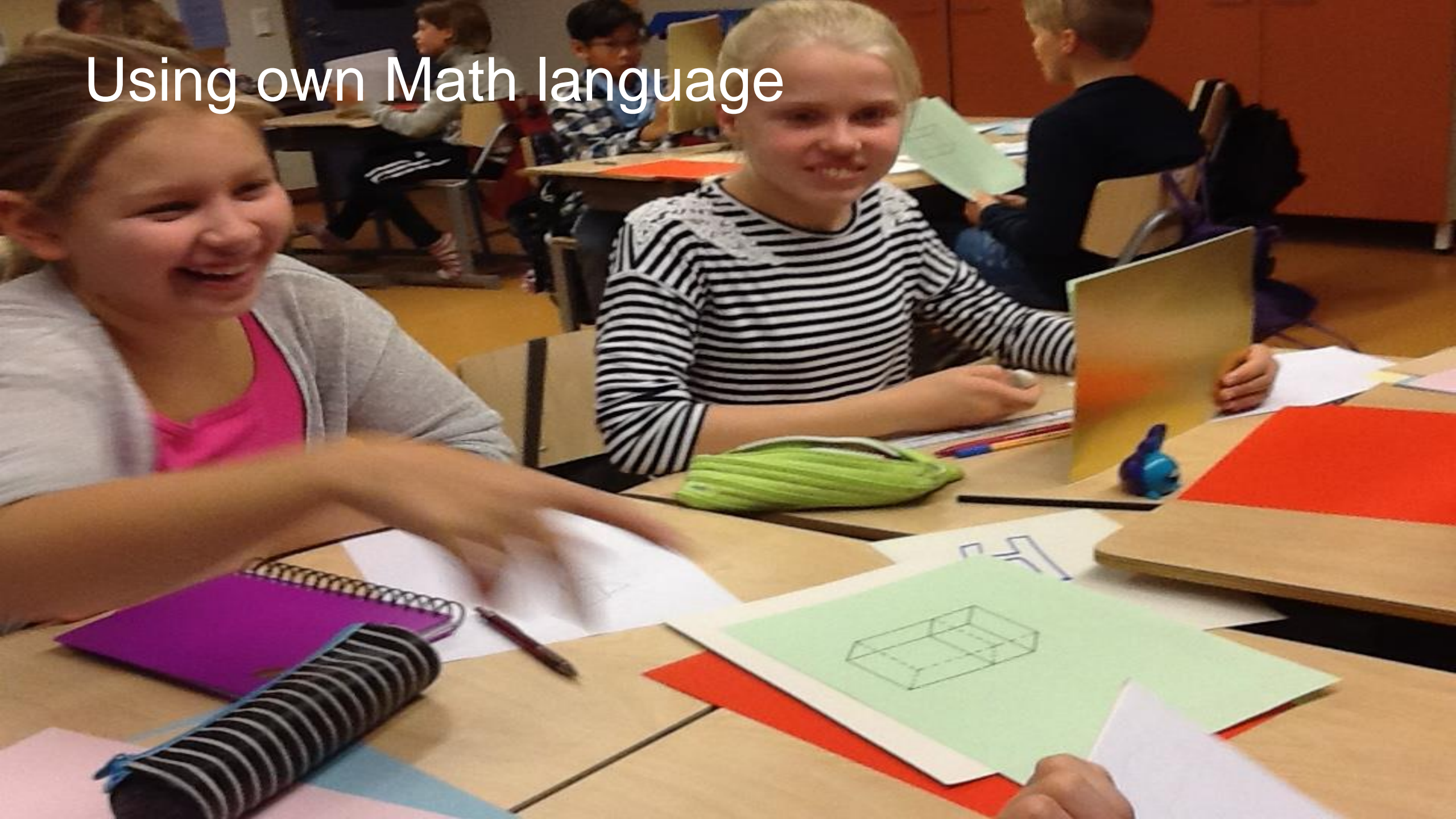
**Physical exercise makes brain work better:
Improve your concentration, mental health
Enhance your creativity
Boost your memory
Don't sit still**

Classifying





Using own Math language



Calculating scales



**From teacher - directed to
student -centered
Versatile teaching methods**

Fascinating



Meaningful and interesting



Fun!



Successful pedagogy is about balance



- Online teacher training
- Workshops
- Intensive Training Program



“Mathematics is a powerful tool that helps us make sense of the world.”

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Thank you.

Maarit Rossi

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