

Stop teaching
calculating,
Start learning maths

Maths education crisis:

Maths v. Maths

Why learn maths?

What is maths?

1. **DEFINE QUESTIONS**

2. **TRANSLATE TO MATH** (real world \rightarrow maths)

3. **COMPUTE ANSWERS**

4. **INTERPRET RESULTS** (maths \rightarrow real world)



Use computers
for...

1. **DEFINE QUESTIONS**

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Use students for...

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Maths: problem-solving process

maths ≠ calculating
maths >> calculating
STEM >> maths

```
Solve[{x + 2 == 2 y, y - x == 5}, {x, y}]
```


Computer-based *not just*
Computer-assisted

Better deployment of
the wrong subject
won't fix the problem...

Major worldwide cost:

21,000 lifetimes/year for
Ancient Greek?

More Practical
is
More Conceptual

Remove the
computer...

⇒ remove the context

What's the best life insurance policy

Old: Mechanics-centred

Completing the square

Inverting matrices

Simplifying Surds and Recurring Decimals

Solving simultaneous equations

The chain rule

New: Problem-centred

Design a currency: what coins and notes do you need?

Should I insure my laptop?

By how many levels of friends are we separated on Facebook?

Making a perfect password for your login

Best strategy for answering multiple-choice questions if ignorant?

What's a beautiful shape?

How much can you compress photos, video or music before you notice?

Example: can I spot a cheat?

Some modern areas of maths:

Data Science

Signal Processing

Geometry

Modelling

Architecture of Maths

Coding central to maths...

**Maths: system of doing
STEM, life**

Coding: way to express
maths

Fix Assessment

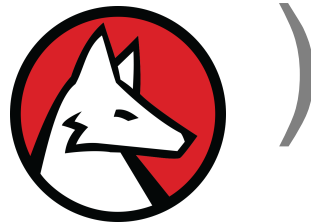
Outcomes»?»?

Why now?

Impetus
Ubiquity
Interface

Example: Computable
documents (CDF) >>

Example: make an app
(with Wolfram Language



Stand on power of
automation...
...now for STEM

ie. work a level up from the

machines,
don't compete...

computerbasedmath.org

CBM inevitable Estonia first...

now trialling in Sweden >>

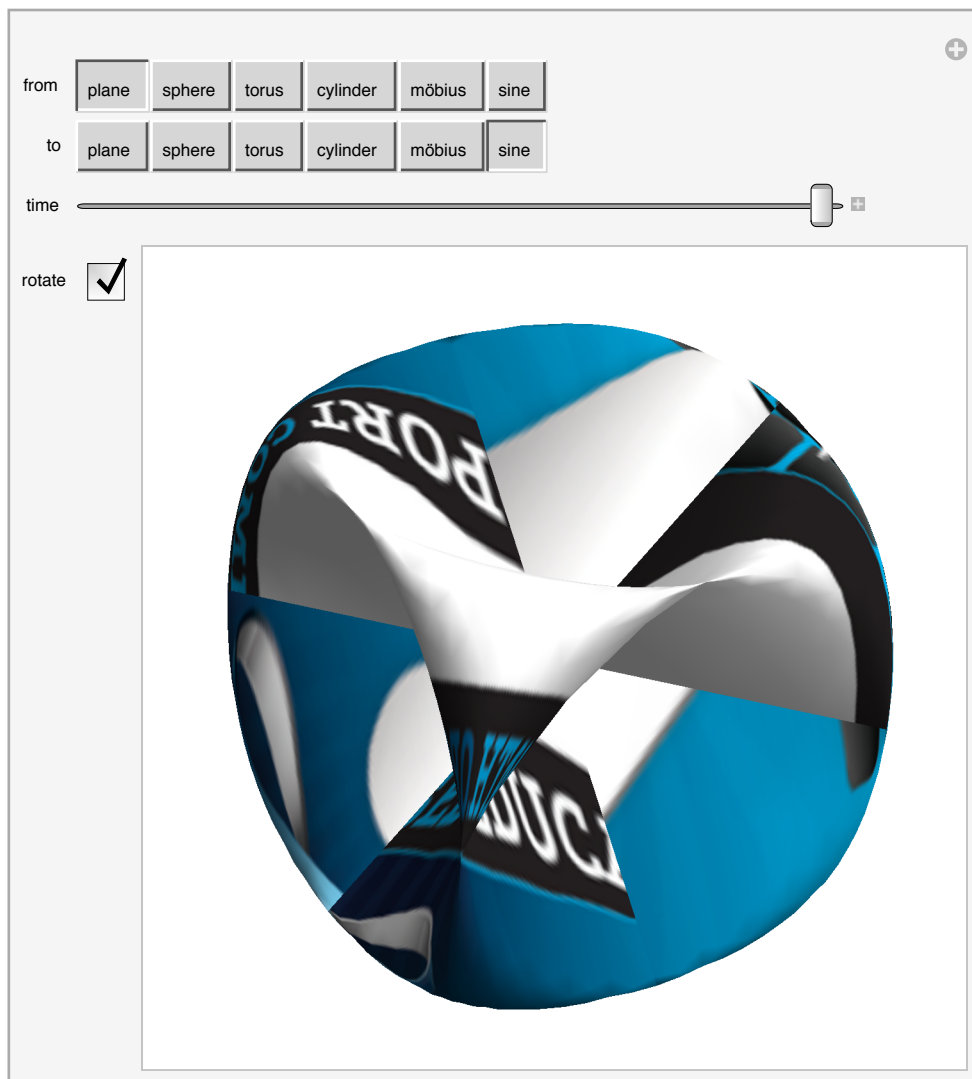
Early countries can
leapfrog

Sweden: ideal profile to
start now

cf. universal education

Key: move political
debate,
drive from industry

Thanks to Ericsson



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