

Save That Baby!

Motivation Through Application?

Bryn Jones

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Welcome

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$$5,500,000 : 119$$

About Me

- Teacher of Maths, Apps and PTC.
- ApplyingMaths.com
- @brynspiration on Twitter/BlueSky

Session Aims

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- Share **when** applications should come into your teaching.

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- Share why using 'real life' maths can be useful.
- ... but highlight the pitfalls.
- Share **when** applications should come into your teaching.
- And make sure you leave with something you can pick up and use!

Background



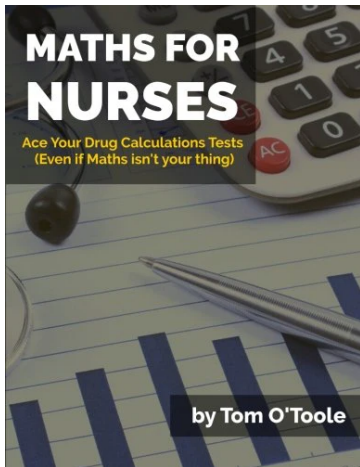
Enhancing the quality of mathematics education in Scotland

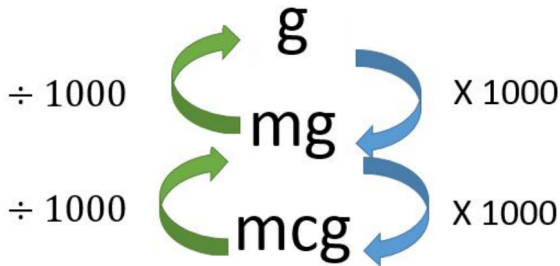
A national thematic report from His Majesty's Inspectors of Education

In secondary schools, particularly for young people in S1 to S3, it is essential for teachers make clearer links between the mathematics they are teaching and its relevance to everyday life. Demonstrating how mathematical concepts apply to real-world situations would help young people see the value of their learning and increase their motivation to engage with the subject.

Which maths topic do you personally find the least interesting to teach?

Save That Baby - Origins





Example- Convert 1250mcg to mg

Example!

We label the drug 1g/10ml.



Every time we inject the patient with 10ml of the stock dose, she gets 1g of the drug.

If we want her to get 4g of the drug, we need to give her how much of the stock dose?

Let's put it all together:

Example- I want to give my patient 500mg of drug A. The stock dose is a 10% solution. How much stock dose should I give?

Stock dose = 10,000mg/100ml

1) Prescribed weight ÷ Stock Weight

$$500\text{mg} \div 10,000\text{mg} = 1/20$$

2) Multiply that answer by the stock volume

$$1/20 \times 100\text{ml} = 5\text{ml}$$

A 'good attempt'

Pros

Increased
'engagement.'

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Cons

It was too blooming
hard.

What I messed up

- Funds of knowledge.
- Cognitive load.
- Concrete vs Applied.

What I messed up

- Funds of knowledge.
- Cognitive load.
- Concrete vs Applied.

We need to ask ourselves: **When** should applications come into our teaching?

Save That Baby - Numeracy



CONGRATULATIONS

YOU SAVED THAT BABY

This certified that

Has successfully completed the Medical Maths - Save That Baby challenge. Demonstrating knowledge of equations, reading charts, metric units, ratio and infant care.

MR JONES
Class Teacher



Age Group	Weight Range	Formula
1-3 months	≤ 5 kg	Age-Based
1-3 months	> 5 kg	Weight-Based
4-6 months	≤ 7 kg	Age-Based
4-6 months	> 7 kg	Weight-Based
7-12 months	≤ 9 kg	Age-Based
7-12 months	> 9 kg	Weight-Based

To work out a dosage, measured in milligrams, use the appropriate formula:

Weight-based formula

$$Dosage = 100 + Mass \times 250$$

Where mass is measured in kilograms.

Age-based formula

$$Dosage = 50 + Age \times 300$$

Where age is measured in months.

Feedback

Feedback from students was positive. We surveyed whether the programme helped them “see how maths is used in real life” (100% agreed), whether they enjoyed the programme (83%), whether they felt more confident in their maths abilities (83%) and whether the programme was memorable (92%).

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My favourite feedback came from two students who didn't want to put their certificates in their bags.
“Can we get it laminated?”

Why we should include real life applications

- 1 Students want us to!

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- 2 It's enjoyable and memorable.

Why we should include real life applications

- 1 Students want us to!
- 2 It's enjoyable and memorable.
- 3 Isn't this kind of the whole point of teaching them maths?

Pitfalls

Beware!

- 1 Cognitive Load.

Pitfalls

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- 2 It's fun... but at what cost?!

Pitfalls

Beware!

- 1 Cognitive Load.
- 2 It's fun... but at what cost?!
- 3 You must time it correctly.

Four Questions

- How many 50 pence pieces do you need to make £20?

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Four Questions

- How many 50 pence pieces do you need to make £20?
- Calculate $20 \div \frac{1}{2}$
- How many halves make 20?
- How many 0.5 mg doses can be made from a 20 mg vial of a photosensitive compound?

Translation vs Application

Translation

- “Express particular ideas or concepts in a new way.”

Translation vs Application

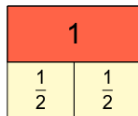
Translation

- “Express particular ideas or concepts in a new way.”
- Concrete, pictorial, abstract.

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$$1 \div \frac{1}{2} = 2$$

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If you understand a context really well- it can be a concrete example and reduce cognitive load.

If a context is alien- then you need to have an abstract understanding in order to **apply** your thinking to the situation.

Discuss

Sharing an amount into a given ratio.

What would be a good concrete example?

What would be an application?

Mastery: A Framework

1 Terms

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- 1 Terms
- 2 Facts

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- 3 Rules and Principles

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- 4 Processes and Procedures
- 5 Translations

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- 6 Applications

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- 2 Facts
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- 4 Processes and Procedures
- 5 Translations
- 6 Applications
- 7 Analyses and Synthesis

Examples

- Statistics
- Fractions
- Algebra

Final Thoughts

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- Think of the topic you find the least interesting to teach.
- Find an application: something practical, silly, or kitsch.
- Break it down into the mastery process. Use the grid.
- Let me know how it goes.

Any Questions?

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