

Wallace Primary School

12th September 2018

Raising Attainment in Renfrewshire

Numeracy and Mathematics in Renfrewshire

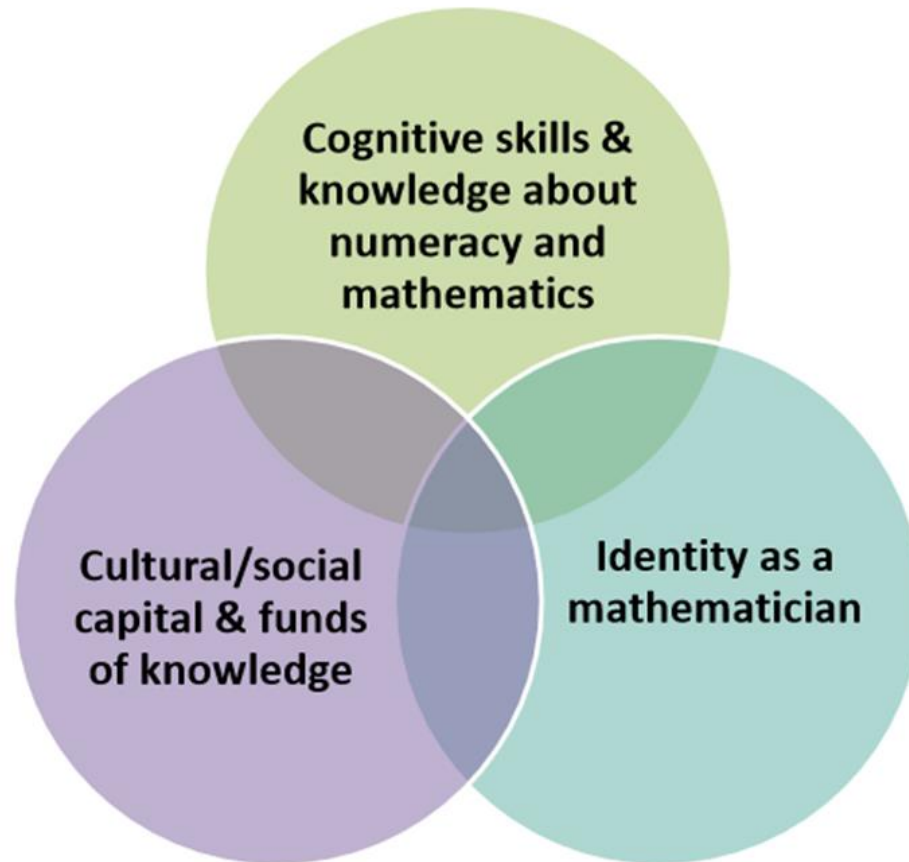
**MAKING
MATHS
COUNT**



 THE SCOTTISH
ATTAINMENT
CHALLENGE
LITERACY NUMERACY
HEALTH & WELLBEING

Attend to data from all three domains...

The 3 Domain Model



Learning & Teaching

Cognitive skills &
knowledge about
numeracy and
mathematics

Differentiated Learning

Baines (2012) analysed the effectiveness of setting and streaming in schools and found learners in high ability classes benefitted when taught a curriculum matched to their ability. However less able learners performed worse when taught in separate streams than when taught in mixed ability classes. He concluded that less able learners appeared to benefit more from mixed ability grouping, while more able learners benefitted equally from both approaches.

By the age of eight, most students have worked out their place in the rankings of the achievement equation. Indeed, Jo Boaler's research has shown that 80% of children who are placed in an ability grouping at age 5 will stay in the same grouping throughout their schooling.

Carol Dweck's work on self-theories shows how most students have developed either a Fixed or Growth Mindset of their intelligence by the time they start school. This mindset is often reinforced by the expectations of their teacher or by their allocation to a particular ability group.

Differentiated Learning...

By differentiating learning, teachers develop multiple starting points and pathways which are tailored to children's individual needs. This can be achieved through modifying the following aspects of learning:

Content e.g. use of learning materials at different levels

Process e.g. varying the length of time children have to complete a task

Product e.g. giving children choice in how to express ideas or required learning

Learning environment e.g. having areas in the classroom for some children to work quietly without distraction (Tomlinson, 2000)



Renfrewshire
Council

Differentiation Through Content



Extra hot

← Highest Level of Challenge



Hot

← Even More Challenging



Mild

← More Challenging



Lemon & Herb

← Mandatory Level of Challenge

Personalisation and Choice

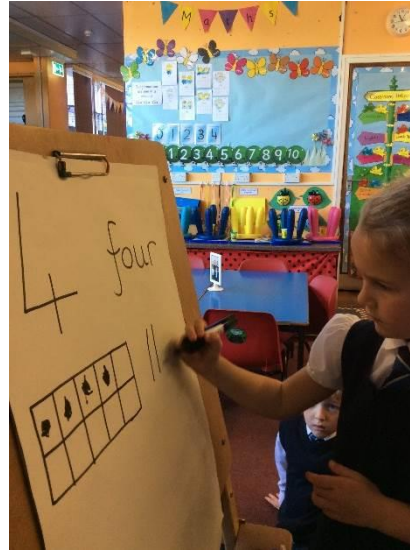
S.E.A.L.

- Stages in Early Arithmetic Learning
- The Curriculum hasn't changed, S.E.A.L. is an approach
- S.E.A.L sets out a programme of the strategies children use in early number situations
- S.E.A.L can be delivered as a whole class lesson. It can also be carried out in stations, where the teacher is supporting at one station. Children move round activity stations in a carousel movement.

S.E.A.L.

- S.E.A.L involves forwards and backwards number word sequences, number identification, spatial patterns e.g. domino patterns and finger patterns.
- These all aid addition, subtraction and early multiplication and division.

S.E.A.L.



Use a range of methodologies...

individual

child-led

group

play-partner

direct teaching

cooperative

adult-initiated

whole class

peer

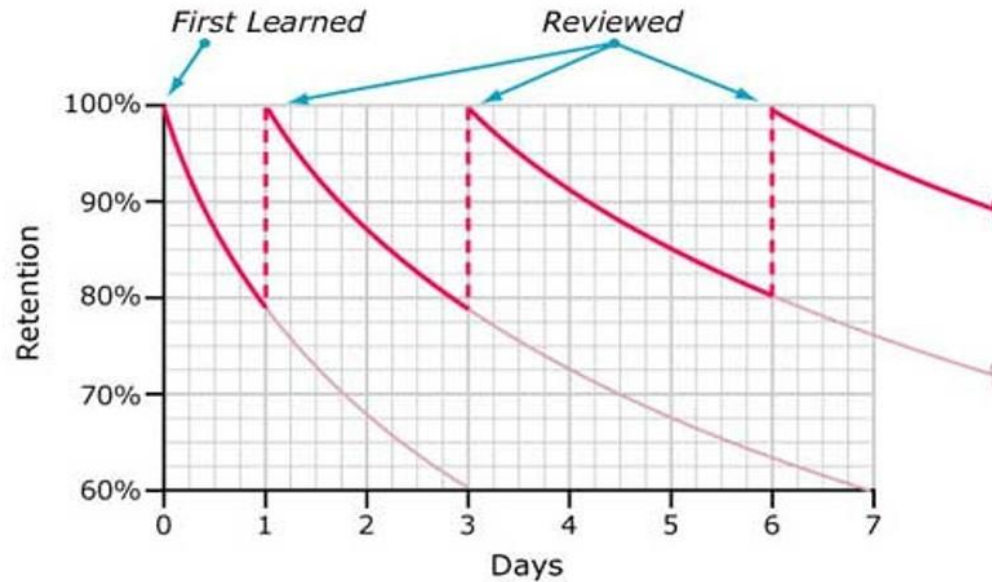
active



Build in opportunities for deliberate practice...

- Deliberate practice aka reinforcement is important to help children create a change in long-term memory

Typical Forgetting Curve for Newly Learned Information



2a 12 minutes and 30 seconds ✓

2b 47 minutes and 30 seconds

3a 33.6 m ✓

3b 720 m ✓

4a 48p ✓

4b £3.60p ✓

5a 9 litres x ✓

5b 60 litres ✓

6a 5.5 kg ✓

6b 137.5 kg ✓

SEC: I feel quite confident and very

0 2.5 m 2.5
6 | 15 30 x 5
12.5

2.5
x 19
22.5
25.0
47.5

4.8
x 7
33.6
5

150
x 4.8
120.0
600.0
720.0

0 4.8 20
40
20 | 96 0 60
80
100
20
96 140
60
-80
160
160
000
0.12p

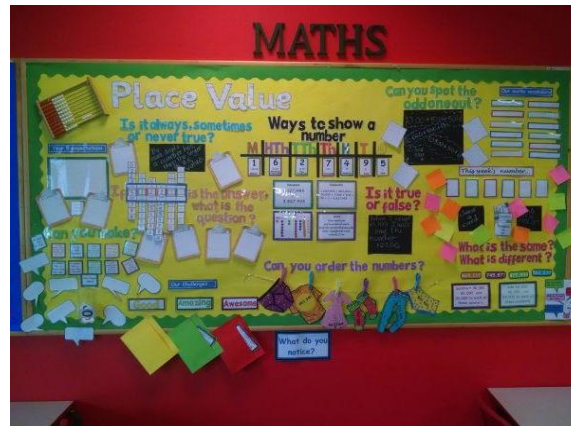
9 | 1.08

12 5.5
4 x 7.5

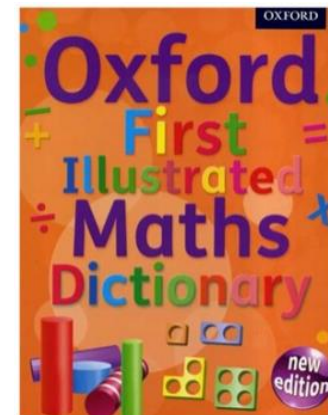
Use correct mathematical language...

- If children can learn words like diplodocus, stegosaurus and triceratops...we can teach them rhombus instead of diamond...
- Allow children to explain their thinking but back it up with the correct language

<http://www.amathsdictionaryforkids.com/>



<https://education.gov.scot/parentzone/learning-at-home/supporting-numeracy/Numeracy%20and%20mathematics%20glossary>



Growth Mindset and Valuing Maths

Identity as a
mathematician

Transforming public attitudes to maths

The strategy should:

Create greater enthusiasm for maths as a vital life skill amongst children and young people, parents and carers and the wider public

Promote the value of maths as an essential skill for every career and an economic imperative if Scotland is to compete internationally

Demonstrate the importance and value of being numerate...

Give examples of why Numeracy and Mathematics is important:

✓ Employment

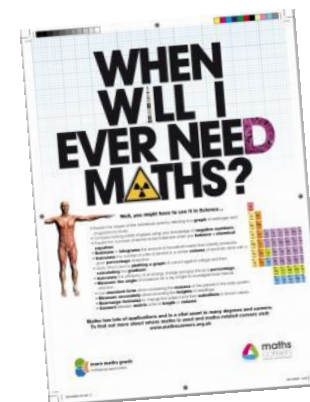
People with poor numeracy skills are more than twice as likely to be unemployed

✓ Wages

Recent data by the OECD show a direct relationship between wage distribution and numeracy skills

✓ Health

In OECD, UK basic skills reports, and British Cohort Studies all show clear links poor numeracy and poor health and depression



Improving confidence and fluency in maths

All schools and nurseries should use a wide range of effective learning and teaching approaches to promote positive attitudes and develop high expectations, confidence and resilience in maths

Teaching for a Growth Mindset

Do your children believe that their abilities are fixed?

Do your children believe that with hard work they can achieve high standards and tackle increasingly challenging problems?

Is there an ethos of 'mistakes are an opportunity to learn' in your class?

Is value put on the 'productive struggle' that happens when children are being challenged or do children fret about looking challenged?

A teacher's job is not to make work easy. It is to make it difficult. If you are not challenged, you do not make mistakes. If you do not make mistakes, feedback is useless.
(John Hattie)



Support from Parents & Carers

Cultural/social
capital and funds
of knowledge

Support from Parents & Carers

Reinforce correct mathematical language

A Maths Dictionary for Kids
2018
by Jenny Eather

::: FREE :: PRINTABLE :::

A MATHS DICTIONARY FOR KIDS ~ DETAILS

The original *A Maths Dictionary for Kids* is an animated, interactive online math dictionary for students which explains over 630 common mathematical terms and math words in simple language with definitions, examples, activities, practice and calculators. *A Maths Dictionary for Kids Quick Reference* is a device friendly *html* version with definitions and detailed examples for over 950 math words and terms.

A Maths Dictionary for Kids Interactive Original Definitions (631 +), examples, activities, practice, calculators. Accessible on computers, requires Flash.	A Maths Dictionary for Kids Quick Reference Updated regularly - now with over 955 words. Accessible on computers, tablets and phones.
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MATHS CHARTS ~ DETAILS

A collection of over 280 free printable maths charts suitable for interactive whiteboards, classroom displays, math walls, student handouts, homework help, introduction and consolidation of mathematical topics and other math reference needs.

Support from Parents & Carers

Acknowledge that Mathematics can be challenging

Encourage your child to be ambitious even when they find mathematics challenging. Mathematics should be challenging and will require your child to exert the necessary effort to meet this challenge.

Support from Parents & Carers

Working is an important part of Mathematics. It is the way in which Mathematicians communicate their processes and thinking.

Ask your child to show all their working and explain the steps which make up a solution.

Ask your child to teach you how to do some questions. You never know, you might also learn some Mathematics

Support from Parents & Carers

Challenge your child if they say “no maths homework tonight.”

At all times, there is home study for Mathematics. The more your child attempts, and the harder your child works, the more they will achieve.

Thank You