YEAR 5 MATHEMATICS CURRICULUM WORKSHOP

Thursday March 9th 2017

Newsham Primary School Blyth

Aims

- Gain an overview of KS2 curriculum for mathematics
- Understand what your child needs to do to achieve mastery and greater depth in KS2
- Look at mental calculation and standard written methods for calculations in KS2

New Primary Mathematics Curriculum

- Higher expectations overall – benchmarked against other nations
- Conceptual development of number addressed in more detail
- Fewer things in more depth
- All pupils are expected to build firm foundations to help them become ready for secondary school.

Aims of the National Curriculum

The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practise with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- **reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

What we actually teach in upper KS2……

- Place Value to 10,000,000 and to thousandths in decimal places
- Rounding any number to 10, 100, 1000, 10,000, 100,000 and decimal numbers to whole numbers and one and two decimal places
- Roman numerals to 1000
- Negative numbers in context
- Multiplication 4/5 digit (whole numbers and decimal numbers) numbers by 2 digit numbers
- Long Division of 4 digit numbers by 2 digit numbers
- Fractions, Decimal and Percentages – Equivalence and amounts of
- Addition and subtraction to 10,000,000

What we actually teach in upper KS2……

- Time - Interpreting Timetables
- Measurement (mass, length, capacity, temperature, perimeter, area, volume, imperial units of measure)
- Money - budgeting
- Ratio and Proportion
- Statistics
- Geometry - Shape and space, Angles
- Geometry - Co-ordinates
- Algebra
- Problem solving and reasoning – including word problems

At the end of KS2- Summer Term 1

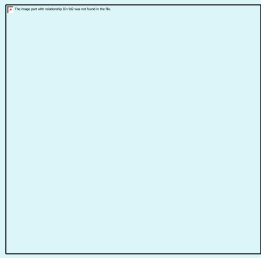
Children will sit 3 mathematics papers:

1 Arithmetic paper - 40 marks

2 Mathematical Reasoning papers - 35 marks each

Total possible marks – 110

98 marks are required to achieve ‘Above Expected’



Interim teacher assessment framework at the end of key stage 2: Mathematics

Working at the expected standard

• The pupil can demonstrate an understanding of place value, including large numbers and decimals (e.g. what is the value of the '7' in 276,541?; find the difference between the largest and smallest whole numbers that can be made from using three digits; 8.09 = 8 + 9/?; 28.13 = 28 + + 0.03).
• The pupil can calculate mentally, using efficient strategies such as manipulating expressions using commutative and distributive properties to simplify the calculation (e.g. 53 – 82 + 47 = 53 + 47 – 82 = 100 – 82 = 18; 20 × 7 × 5 = 20 × 5 × 7 = 100 × 7 = 700; 53 ÷ 7 + 3 ÷ 7 = (53 +3) ÷ 7 = 56 ÷ 7 = 8).
• The pupil can use formal methods to solve multi-step problems (e.g. find the change from £20 for three items that cost £1.24, £7.92 and £2.55; a roll of material is 6m long: how much is left when 5 pieces of 1.15m are cut from the roll?; a bottle of drink is 1.5 litres, how many cups of 175ml can be filled from the bottle, and how much drink is left?).
• The pupil can recognise the relationship between fractions, decimals and percentages and can express them as equivalent quantities (e.g. one piece of cake that has been cut into 5 equal slices can be expressed as 1/5 or 0.2 or 20% of the whole cake).
• The pupil can calculate using fractions, decimals or percentages (e.g. knowing that 7 divided by 21 is the same as 7/21 and that this is equal to 1/3; 15% of 60; 11/2 + 3/4; 7/9 of 108; 0.8 x 70).
• The pupil can substitute values into a simple formula to solve problems (e.g. perimeter of a rectangle or area of a triangle).
• The pupil can calculate with measures (e.g. calculate length of a bus journey given start and end times; convert 0.05km into m and then into cm).
• The pupil can use mathematical reasoning to find missing angles (e.g. the missing angle in an isosceles triangle when one of the angles is given; the missing angle in a more complex diagram using knowledge about angles at a point and vertically opposite angles).

Mastery in Mathematics….

Achieving mastery in certain areas or concepts is not just being able to memorise key facts and procedures and answer test questions accurately and quickly….

- It involves knowing ‘why’ as well as knowing ‘that’ and knowing ‘how’

- It means being able to use their knowledge appropriately, flexibly and creatively and be able to apply it in new and unfamiliar situations.

Achieving Mastery in Mathematics….

A pupil really understands a mathematical concept, idea or technique if he or she can:

• describe it in his or her own words;
• represent it in a variety of ways (e.g. using concrete materials, pictures and symbols)
• explain it to someone else;
• make up his or her own examples (and non-examples) of it;
• see connections between it and other facts or ideas;
• recognise it in new situations and contexts;
• make use of it in various ways, including in new situations.

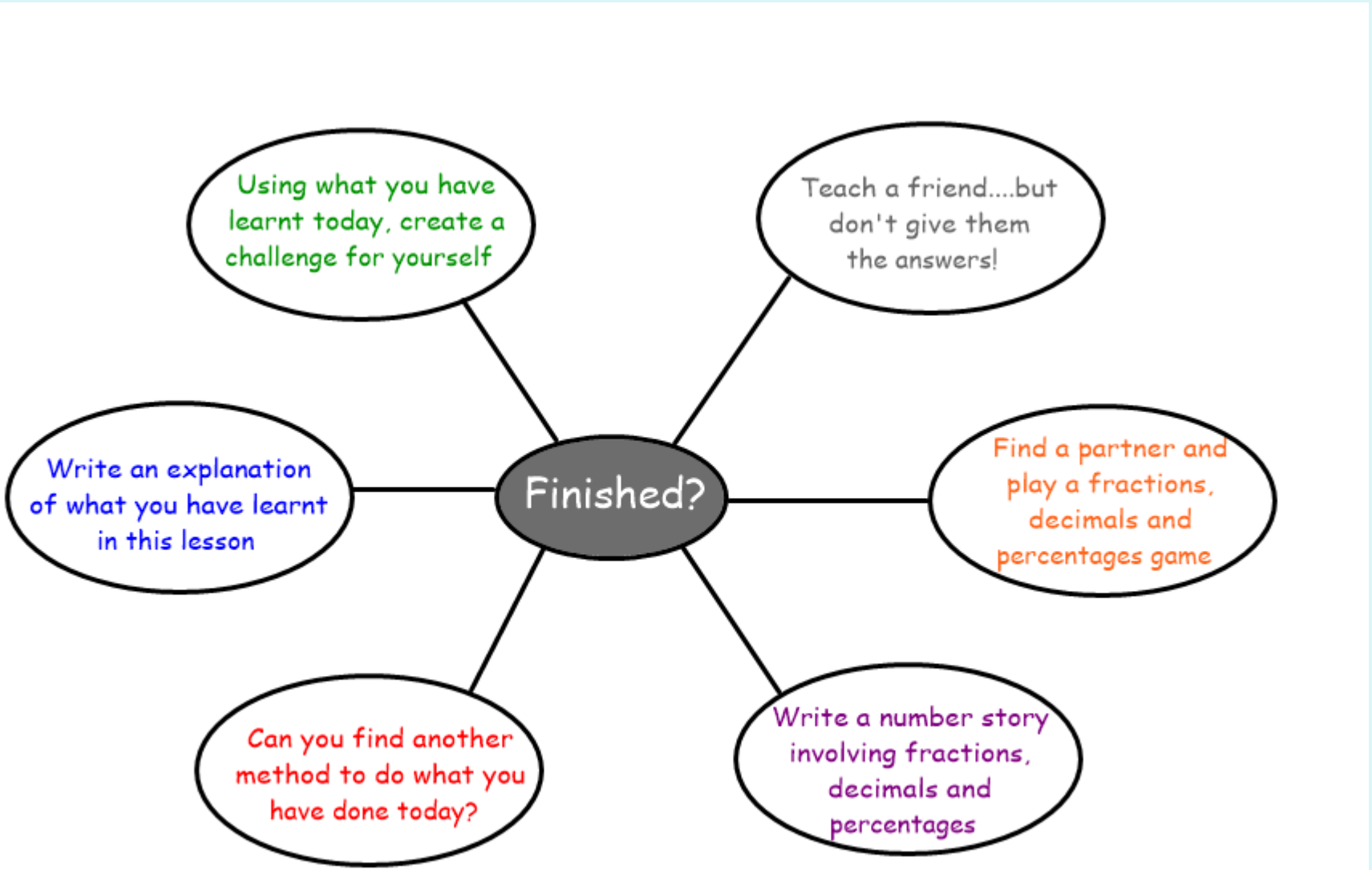
Developing mastery with greater depth is characterised by pupils' ability to:

• solve problems of greater complexity (i.e. where the approach is not immediately obvious), demonstrating creativity and imagination;
• independently explore and investigate mathematical contexts and structures, communicate results
clearly and systematically explain and generalise the mathematics.

Mastery and Greater Depth Mastery

https://www.ncetm.org.uk/public/files/23305628/Mastery_Assessment_Y5_High_Res.pdf

Pupils demonstrate Greater Depth Mastery in school by….



Here are some example questions

1. A school buys some yo-yos as prizes. The yo-yos cost £4.25 each. The school has £40 to spend on prizes. They buy as many yo-yos as they can. How much money is left? Explain your answer.

2. Three whole numbers add up to 50. Seb says, ‘All three numbers must be even numbers.’ Is Seb correct?

   Answer Yes or No.

   Explain how you know.

Here is an example of a word problem for a child working just within the ‘Expected ‘level in Year 5:

Dev and Joe each buy a book.
Dev pays with a £5 note and gets £1.05 change.
Joe’s book costs £7
How much **more** does Joe’s book cost than Dev’s book?

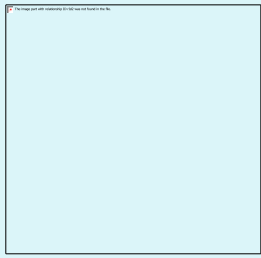
Explain your answer

https://www.gov.uk/government/publications/2016-key-stage-2-mathematics-sample-test-materials-mark-schemes-and-test-administration-instructions

In order for children to achieve mastery they need to be secure with basic number facts, times tables and formal calculation methods.

Please…

Practise, Practise, Practise times tables and related division facts!



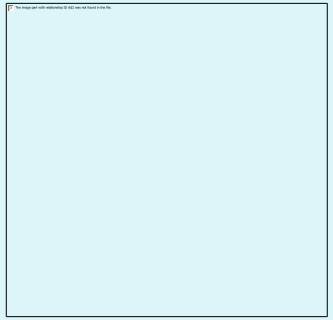
Mental Mathematics

It is essential children have secure knowledge and recall of mental facts including: -

Place Value including decimals

Number bonds

Times tables from 0 to 12 - Corresponding division facts.



Why is mental calculation important?

$$\begin{array}{r} 2000 \\ -102 \\ \hline \end{array}$$

How would you approach this problem?

Making Links

25 x 8 =

Children relying on written procedures forget how much they can do mentally

25 x 8 is double 25 x 4, 25 x 2

Multiplication and Division

Use known facts to find answers to multiplication and division problems

4 x 8 = 2 x 16 = 32

(doubling and halving)

9 x 6 is (10 x 6) – 6 = 54

(rounding and compensating)

63÷7= 9 because 9 x 7=63

(inverse)

Times Tables

Knowing and embedding all times tables facts leads to greater understanding of corresponding division facts.

Times Tables knowledge is essential in understanding and applying that knowledge with questions relating to factors, multiples, prime number, square numbers,

fractions, decimals, percentages and equivalence

between these.

How can you help at home…?

Lots of practise and discussion

- Playing games – cards, dominoes, board games
- Shopping – paying with actual money, savings accounts.
- Watching the weather report comparing temperatures around the world.
- Cooking – Any kind of practical activities involving mass, length and capacity that you can do at home will really benefit your child's understanding of these concepts.
- Telling the time – reading timetables and timing journeys, helps develop a concept of lengths of time.

Thank you!

Any Questions?