MATHS CALCULATION POLICY - YEAR 6

PURPOSE

This policy outlines the agreed approach to teaching calculation in Year 6. It ensures:

- Consistency of models, language and expectations across classrooms.
- Secure progression from long multiplication and long division into more complex multi-step calculation.
- Strong fluency with integers, decimals, fractions and powers of 10.
- Alignment with NCETM Curriculum Prioritisation for main maths teaching.

AIMS

- Strengthen and extend place-value understanding within numbers up to 10,000,000.
- Consolidate and refine formal written methods for all four operations.
- Use consistent representations to expose structure and support reasoning.
- Build fluency through structured rehearsal and intelligent practice.
- Develop precise mathematical language and encourage pupils to justify, generalise, and evaluate methods.
- Depth before acceleration; pupils move together through the curriculum.

KEY LEARNING EXPECTATIONS

1. Number Sense and Place Value

Year 6 pupils will:

- Understand numbers to 10,000,000, including the value of each digit.
- Partition numbers flexibly (e.g., 7,304,500 as 7,000,000 + 300,000 + 4,500 or 6,000,000 + 1,304,500).
- Compare and order numbers using place-value reasoning.
- Round numbers to any degree of accuracy.
- Count forwards and backwards in powers of 10 and powers of 2.
- Recognise patterns and relationships within the number system.

2. Addition

Conceptual Understanding

- Combining quantities using place-value reasoning.
- Understanding addition as part-whole and as movement along a number line.
- Using rounding & estimation to check accuracy.

Strategies

- Counting on using place value.
- Bridging through multiples of 10, 100 & 1000 and beyond.
- Using known facts & related facts.
- Compact column addition (formal method).

Fluency Expectations

- Confident addition of large integers and decimals.
- Secure use of estimation to check reasonableness.
- Efficient mental addition using partitioning and adjusting.

3. Subtraction

Conceptual Understanding

- Removing from a quantity.
- Finding the difference.
- Understanding subtraction as part-whole and as movement backwards on a number line.
- Using rounding and estimation to check accuracy.
- Choosing efficient methods (mental, informal, formal).

Strategies

- Counting back.
- Counting on to find the difference.
- Using known bonds.
- Compact column subtraction with exchanging.

Fluency Expectations

- Confident subtraction of large integers and decimals.
- Efficient mental subtraction using partitioning and adjusting.

4. Multiplication

Conceptual Understanding

- Multiplication as scaling and repeated addition.
- Understanding factor relationships and multiplicative structure.
- Moving from long multiplication to efficient application in multi-step problems.

Facts

- Secure multiplication tables to 12 × 12.
- Use related facts and factor relationships to support efficiency.

Written Method

- Short multiplication (formal).
- Long multiplication (formal) for up to 4-digit × 2-digit numbers.

5. Division

Conceptual Understanding

- Division as sharing and grouping.
- Understanding the relationship between multiplication and division.
- Interpreting remainders appropriately depending on context.
- Moving from short division to long division.

Facts

- Secure division facts linked to all multiplication tables to 12 × 12.

Written Method

- Short division (formal).
- Long division (formal) for up to 4-digit ÷ 2-digit numbers.
- Division with remainders, including interpreting remainders in context.

6. Fractions, Decimals and Percentages

Year 6 pupils will:

- Compare and order fractions with different denominators.
- Add and subtract fractions with different denominators.
- Multiply and divide fractions by integers.
- Convert between improper fractions and mixed numbers.
- Understand decimal–fraction–percentage relationships.
- Solve problems involving percentages, including percentage increase and decrease.
- Read, write, and compare decimals to three decimal places.

7. Ratio and Proportion

Year 6 pupils will:

- Understand ratio as a multiplicative relationship.
- Use ratio language and notation.
- Solve problems involving scaling.
- Understand proportion as part of a whole or part of a set.

7. Algebra (Early Concepts)

Year 6 pupils will:

- Use simple algebraic notation.
- Recognise and generate number sequences.
- Solve missing number problems using inverse operations.
- Understand variables and expressions.

REPRESENTATIONS & MODELS

Year 6 teachers will use the following consistently:

- Part-whole models for addition and subtraction.
- Number lines for all four operations and fractions/decimals.
- Place-value counters for multiplication, division, and place value.
- Bar models for multiplication, division, fractions, percentages, ratio, and proportion.
- Concrete manipulatives where appropriate.

Representations must be used to expose structure and support reasoning.

MENTAL FLUENCY EXPECTATIONS

By the end of Year 6, pupils should have secure fluency in:

- Addition and subtraction of large integers and decimals.
- Number bonds to 10, 20, 100, 1000, and beyond.
- All multiplication tables to 12 × 12.
- Related division facts.
- Counting in powers of 10 and powers of 2.
- Efficient mental strategies using place value.
- Rounding and estimation to check accuracy.
- Choosing efficient methods for multi-step problems.

WRITTEN METHODS

Year 6 consolidates and refines formal written methods for all four operations. Pupils record using:

- Number sentences.
- Part-whole diagrams.
- Number lines.
- Compact column addition and subtraction.
- Short multiplication and long multiplication.
- Short division and long division.
- Decimal calculations using formal methods.
- Fraction calculations using formal methods.

MATHEMATICAL LANGUAGE

Teachers model and expect precise vocabulary, including:

- Addition: add, plus, total, sum, altogether, increase, estimate.
- Subtraction: subtract, minus, take away, difference, decrease, exchange.
- Multiplication: multiply, times, product, factor, multiple, scaling.
- Division: divide, share, group, quotient, remainder, interpret.
- Fractions/decimals/percentages: numerator, denominator, improper fraction, mixed number, decimal place, percentage.
- Ratio and proportion: ratio, proportion, scale factor.
- Algebra: variable, expression, equation.

Language is embedded in daily routines and reasoning discussions.

ASSESSMENT

Teachers use:

- NCETM Curriculum Prioritisation Assessments.
- Daily formative assessment through questioning, observation, and pupil talk.
- Small-step intervention for pupils needing additional practice.

INCLUSION

All pupils access the same curriculum. Support is provided through:

- Concrete manipulatives.
- Pre-teaching.
- Guided practice.
- Structured rehearsal.
- Challenge is provided through depth, not acceleration.
- Targeted Interventions.

EXPECTATIONS OF TEACHERS

- Follow NCETM Curriculum Prioritisation for planning.
- Deliver daily Mastery Number sessions.
- Use consistent representations and language.
- Prioritise depth and secure understanding.
- Engage with ongoing professional development linked to mastery.

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