MATHS Curriculum

Southdale C of E Junior school
Shining like stars in the universe

A high-quality mathematics education engineers successful acquisition, consolidation and application of core mathematical knowledge for all pupils.

The why – underlying conceptual understanding - manipulatives & pictorial is built alongside procedural fluency

Declarative knowledge	Procedural knowledge	Conditional knowledge	Components & Sequencing	Memory	Disciplinary rigour
I know that	***I know how***	***I know when***	Through using NCETM, topics are broken down into manageable steps. Each lesson has a clearly defined and specific focus, ensuring that the ratio of new to previously learned (linked) content is weighted towards the latter. procedural knowledge and the relevant conceptual knowledge are developed in tandem, and both feed into mathematical reasoning and problem-solving tasks are identified as appropriate for chn. Planning enables chn to use and apply new component parts (including conceptual links) are closely aligned and related to the sequence of teaching	Memory is considered through sequencing and teaching. The MM part of the lesson ensure overlearning of content through regular intervals. Silent modelling ensures unnecessary distractions are removed. Co-constructed SC is on display and adapted. . Chn refer to previously taught content so that this can be built upon. Metacognitive talk is used to ensure thinking is prioritised and misconceptions are decreased. Feedback happens throughout the lesson.	Children know that proficiency in mathematics requires sustained effort and focus. Our curriculum ensures children are encouraged to be precise, accurate and systematic in their mathematical endeavours. Plans give pupils undisturbed opportunities to hone their effort and focus. **Gaps in learning** Gaps in learning are picked up quickly. through AfL and the key progression documents. Number facts and multiplication gaps are addressed through additional support.
The curriculum is sequenced so that key facts are learnt. DfE ready to progress guidance alongside ready to progress assessments (NCETM) for each strand. Also linked to the colour coded mental mathematics document. Prior learning is revisited and build on NCETM sentence stems – whole sentences/correct vocabulary – reasoning further developed through ISEEMATHS	Clear calculation policy in place to ensure that most efficient methods are used once conceptual understanding is there. Mental maths procedures clear and consistent for each area. Silent modelling leads to co-constructed steps – simplified through the sequence. Speed and accuracy is built through mental maths whiteboard work. This is done daily with misconceptions being addressed. Key progression documents ensure children learn to automaticity	Developing expertise in reasoning and problem solving is integral to all lessons. Through the small steps in NCETM and the dong nao jin problems alongside ISEEMATHS, slow reveal children are able to identify the deep structure of: abstract or purely mathematical problems; real world problems; routine or non-routine problems, which can be either abstract or real-world. Through sequenced teaching and daily mental maths children have the atomicity of key facts to equip them to solve these questions			

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Pedagogy – new content is built in logical steps broken down by NCETM. Instruction is concise and clear – manipulatives are used to build conceptual understanding – pictorial images are used alongside this. Silent modelling, SC, metacognitive talk. Precise vocabulary – sentence stems.

Assessment – MM enables children to regularly recall core facts & revisit previously taught content.

Systems – MM, overlearning, documents identifying key facts, support with planning, teaching, clear consistency within & across year groups.

Policy & culture – clear calculation policy and MM policy, feedback in lessons, MyMaths to support at home. Our aim is for all those learning maths to enjoy the subject, and to appreciate its power and value in the wider world.

Declarative knowledge

Lower Key Stage 2 Concepts, representations and associated vocabulary:

Arithmetic: enhanced knowledge of the code for number (to 1000s) including patterns and associated rules for addition and subtraction of numbers, decimal numbers, place value, negative numbers, associative and distributive laws

- Maths facts: all multiplication facts for the 3, 4, 6, 7, 8, 9, 11, 12 multiplication tables, decimal equivalents of key fractions equivalent fractions
- Formulae: Units of measurement conversion rules, formulae for perimeter and area
- Roman Numeral system and associated historical facts
- Geometry facts: right angles, acute and obtuse angles, right angles in whole and half turns, symmetry, triangle and quadrilateral classifications; horizontal, perpendicular, parallel and perpendicular lines
- Links between words/phrases in word problems and their corresponding operations in mathematics (e.g. 'spending' is associated with 'subtraction from an amount')
- The rules for multiplying and dividing by 10, 100 and 1000 First quadrant grid coordinate principles

Upper Key Stage 2 Concepts, representations and associated vocabulary:

- Enhanced knowledge of the code for number: up to and within 1 000 000, multiples, factors, decimals, prime number facts to 100, composite numbers, indexation for square and cubed numbers
- Properties of linear sequences
- Conversion facts metric to imperial measurements and vice versa
- Key circle, quadrilateral and triangle facts and formulae (e.g. angles on a straight line sum to 180 degrees) Rules and principles governing order of operations

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Procedural knowledge

Lower Key Stage 2 Efficient and accurate methods:

- Counting up and down in multiples of 3, 4, 6, 7, 8, 9, 11, 12, 25, 50, 100, 1000, in tenths, in ones through to negative numbers
- Column addition and subtraction
- Mental addition and subtraction using patterns and rules of number Short division and multiplication
- Mental multiplication using derived facts
- Fractions: finding unit and non-unit fractions of amounts, common equivalents, addition, subtraction and comparison of fractions with the same denominator
- Measure, compare, add, subtract: lengths, mass, capacity (all units of measurement)
- Read, write and compare roman numerals
- Draw 2D and 3D shapes Interpret and present data
- Estimation and rounding
- First quadrant grid construction, plotting and translation of points

Upper Key Stage 2 Efficient and accurate methods:

- Scaling, coordinate geometry in all four quadrants
- Division with remainders as fractions, decimals and where rounding is needed
- Fractions: conversion mixed to improper and vice versa, add, subtract and multiply
- Finding percentages of amounts
- Converting units of measurement
- Measurement of length, angles, area, perimeter, volume
- Use of order of operations Convert between fractions, decimals and percentages
- Linear algebra, basic trigonometry
- Long multiplication and division

Conditional knowledge

Lower Key Stage 2 Use combinations of taught and rehearsed facts and methods to:

- Complete written exercises
- Solve missing number, length problems
- Solve word problems involving arithmetic, fractions, data handling, shape, length, mass and capacity

Upper Key Stage 2 Use combinations of taught and rehearsed facts and methods to:

- Complete written exercises Find missing quantities, lengths, angles
- Solve one- and two-step word problems involving all the operations
- Abstract and solve linear equations from word problems

"Mathematics is, in its way, the poetry of logical ideas."

– Albert Einstein