VALLEY INVICTA
PRIMARY SCHOOL AT
LEYBOURNE CHASE

Mathematics Policy

September 2020

Vision Statement

Shaping Tomorrow's Future Together

At Leybourne Chase we chase our dreams, achieve all and inspire others.

We want our pupils to love learning and to appreciate the opportunities that this brings. We encourage all our children to be curious about the world around them and to ask questions, to challenge what they observe and what they learn so that they are ready for the dynamics of the modern world.

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Intent

At Leybourne Chase we aim, through well planned and engaging lessons, to create a sense of excitement and curiosity around mathematics. Children are encouraged to make links between what they are learning and the world around them. As children at Leybourne Chase learn mathematics, they are acquiring fluency in mental methods as well as written methods. The high-quality mathematics education we endeavour to provide builds a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject and the recognition that maths is essential to everyday life. We believe in a 'teaching to mastery' curriculum where children develop as successful, confident young mathematicians.

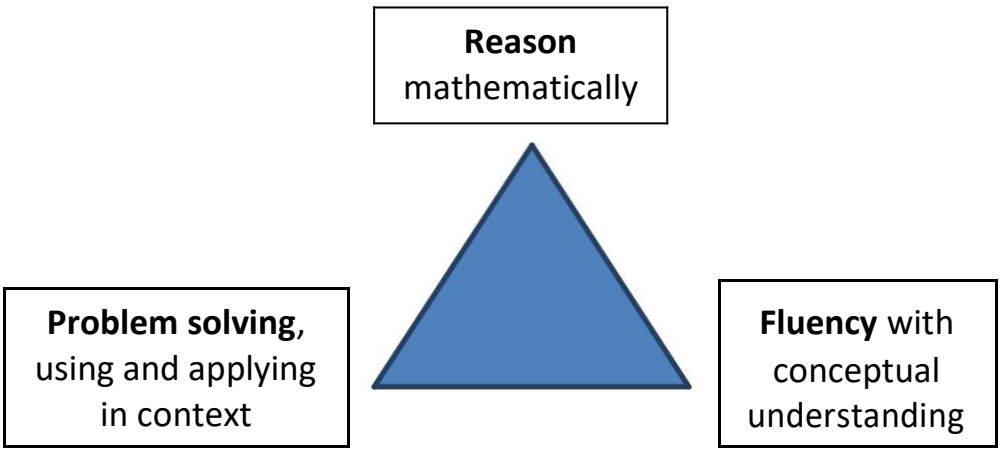
Implementation

The National Curriculum for mathematics aims to ensure all pupils:

- Become **fluent** in the fundamentals of mathematics so that they are efficient in using and selecting the appropriate written algorithms and mental methods, underpinned by mathematical concepts

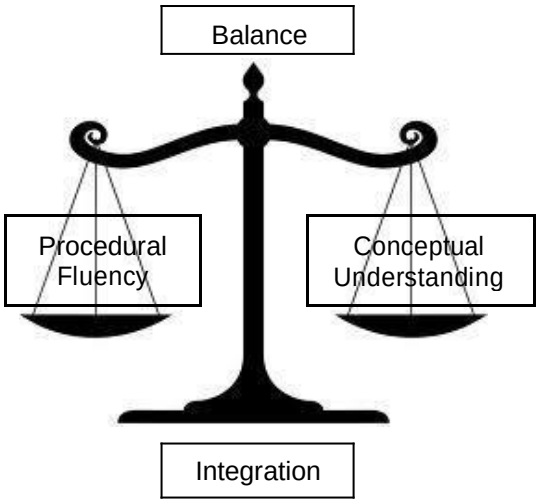
- Can **solve problems** by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios

- Can **reason mathematically** by following a line of enquiry and develop and present a justification, including in unfamiliar mathematical language.



In order that fluency in mathematics in attained, children need to know that quick and accurate mental recall of facts is essential. Pupils are expected to practise and then apply their mathematics to a range of problems. Through a curriculum based on conceptual understanding, children are able to select and apply different mathematical methods in different contexts. Solving contextualised problems is integral to maths learning at Leybourne Chase and analysing, identifying patterns, proving, recognising, remembering, identifying, using conjecture, finding relationships and making generalisations are fundamental to embedding mathematical skills that can be built on throughout our pupil's school life.

Our pupils are empowered with accurate mathematical language with which they are able to communicate their ideas effectively. Perseverance and determination are skills developed across the curriculum but particularly through problem solving in mathematics. Our approach is to balance and integrate procedural fluency with conceptual understanding.



Although the way we teach calculation is organised in a sequence, teaching staff work with the ethos that individual pupil's needs denote the part of the curriculum that should be accessed. Progression in mathematics for all children is essential and so, no matter what their starting point, through accurate assessment, high expectations and quality teaching, pupils at Leybourne Chase are able to work at a level which ensures that they make progress which is built on firm foundations. All teachers at Leybourne Chase ensure children with special educational needs are carefully planned for and inclusivity is at the heart of all we do. Cross-curricular links are made where possible, particularly in science, through the use of technology and during whole school topics. The Early Years Curriculum ensures mathematics is interactive, based on real life experiences and encompasses adult led and child led activities.

Children at Leybourne Chase understand that mathematics can be found everywhere and in everything. They know that exploring and being creative with maths is essential to developing an enthusiasm and fascination for the subject.

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At Leybourne Chase we are guided by the learning principles of Jerome Bruner who put forward a theory that people learn in three basic stages: by handling real objects, through pictures, and through symbols. The children at Leybourne Chase are given opportunities to handle "concrete" things, to draw one-to-one "pictorial" iconic representations of them, then to eventually understand and use the mysterious "abstract" symbols with confidence. We call this our CPA approach and is a core principle underpinning our maths teaching.

The Foundation Stage

Mathematical understanding starts from before a child comes to school and is developed in the foundation stage through active hands-on learning. Every lesson includes a whole class practical 'anchor' task where children are encouraged to talk about and practically explore the topic.

A focus area for maths is a part of continuous provision and continually available for children. This area provides different physical models for maths and is set up to engage children to think, explore, discuss and reason. Key focus includes number recognition, number value and number bonds to 10.

Maths is provided throughout the children's learning environment to help children make connections with mathematics across the curriculum.

In Key Stage One

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This involves working with numerals, words and the four operations using the CPA approach.

At this stage, pupils develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching also involves using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
By the end of Year 2, pupils will know number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency as practice makes permanent.

Mental arithmetic is provided every day in Key Stage One. It is planned as part of every lesson and the children's understanding is supported by visual models, including concrete, pictorial and abstract models. Mental arithmetic is used to consolidate previous learning, to reason, to develop mental recall and to develop mental agility. Opportunities for engaging in mental arithmetic happen throughout the day as well as in lesson time

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In Lower Key Stage 2

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This ensures that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At the end of Year 4, pupils take the Multiplication Tables Check (MTC) which tests multiplication facts from 2 – 12. Currently, the tests do not include related division facts however, at Leybourne Chase we teach the inverse operations as we believe these are key to a full understanding.

Also, at this stage, pupils develop their ability to solve a range of problems, including problems with simple fractions and decimal place value. Teaching also ensures that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them.

In Upper Key Stage 2

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers and decimals. This will develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures consolidates and extends knowledge developed in number. Teaching also ensures that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of year 6, most pupils will be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

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Rationale

This policy contains the written and mental arithmetic methods that are taught at Leybourne Chase. It has been written to ensure consistent progression throughout the school and reflects a whole school agreement having been written in collaboration with teaching staff, children and school governors.

The progression is set out in year groups. However, children should not be discouraged from using previously taught methods with which they are secure, while the new concepts are becoming embedded. Nor should children be stopped from going on to the next stage but, in this case, it is essential for their teacher to see that they are ready for this. At Leybourne Chase, the aim is for children to be able to independently select an efficient method of their choice that is appropriate for the given task. At Leybourne Chase, we emphasise the use of models and images to help children understand calculation strategies

Further explanation of the stages

For each of the four operations (addition, subtraction, multiplication and division), a progression of stages is demonstrated to show how a child will develop in their written and mental calculation methods. The written calculation methods have drawn examples and the mental calculation strategies are shown to demonstrate what would support this method. In addition to this, the visual equipment that will be used to support children is shown.

Commitment to working with families

At Leybourne Chase, we recognise the importance of working closely with our families to support the development of all of our children. We have previously run, and are in the process of developing, maths workshops where the teaching staff support parents and carers to understand the ways we learn maths at Leybourne Chase and how they can support their child(ren) at home. We provide suggestions of maths games and activities to complete at home, as well as subscribing to and providing links to several online websites to support mathematical learning outside of school.