# Days Lane Primary School

# Mathematics Policy

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## Purpose:

"Mathematics is essential for everyday life and understanding our world. It is also essential to science, technology and engineering, and the advances in these fields on which our economic future depends. It is therefore fundamentally important to ensure that all pupils have the best possible mathematics education." (HMCI, 2012, p4.)

Mathematics is in all aspects of our lives and helps us to make sense of our world. With this in mind, at Days Lane Primary School, we promote the basic and wider understanding of mathematics, and hopes to instil an enjoyment in the subject by supporting children to engage with it and build upon their own understanding and promote further learning. Learning key mathematics skills are an important aspect and should be taught and learned in a real life context.

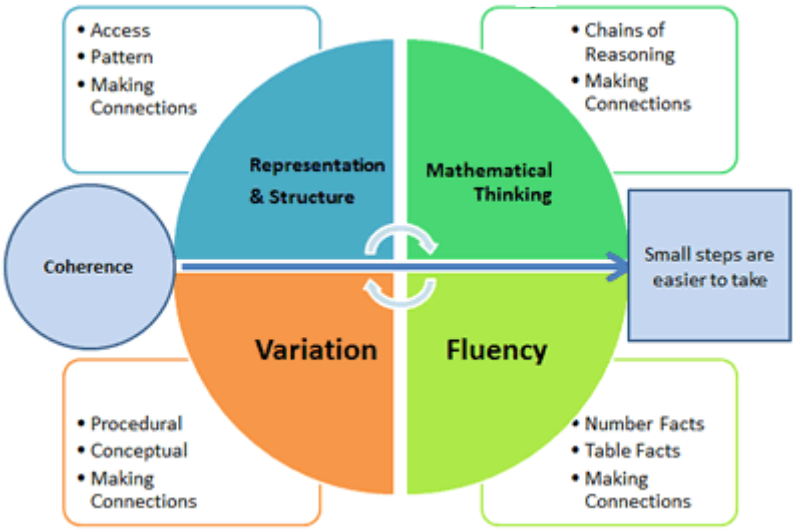
## Aims:

At Days Lane, we aspire to teach mathematics in a way that:

- delivers mathematics in line with National Curriculum guidelines and the Statutory Framework for the Early Years Foundation Stage
- ensures the delivery of mathematics is filled with cross curricular opportunities
- creates a lively, exciting and stimulating environment
- promotes the concept that acquiring mathematics knowledge and skills provides the foundation for understanding the world around the children
- develops mental strategies
- encourages children to use mathematical vocabulary to reason and explain their answers in detail
- allows time for partner talk in order to stimulate and develop a curiosity for mathematics
- challenges children to deepen their understanding and take risks in their learning through teaching for mastery

What is teaching for mastery?

There are Five Big Ideas that underpin the teaching for mastery and the following diagram highlights how these ideas are bound together.




**Coherence -** Lessons are broken down into small connected steps that gradually unfold the concept being taught, for example, addition. This will allow all children to access the learning and allow the children to apply the concept to a range of different contexts, for example, word problems.

**Representation and Structure -** Representations used in lessons to help children understand the mathematical structure being taught, for example, the column method for addition.

**Mathematical Thinking –** During lessons, children are given time to discuss their thoughts and ideas, so that they have a deeper understanding of the mathematical concept being taught. For example, teach their partner how to solve a missing number equation.

**Fluency -** Quick and efficient recall of facts and calculation methods and the flexibility to move between different contexts and representations (Base 10 and the bar model) of mathematics.

**Variation –** When learning about different areas of maths, children are taught a wide range of strategies and use different representations/concrete resources to support them in their understanding.

EYFS – Teaching of Mathematics:

At Days Lane, mathematics within EYFS is developed through purposeful, play based experiences and is represented throughout the indoor and outdoor provision. The learning is based on pupil's interests and current themes and is focused on the expectations from Development Matters / Early Years Outcomes. Mathematical understanding can be developed through stories, songs, games, imaginative play, child initiated learning and structured teaching. As pupils progress throughout the academic year, they will be encouraged to record their mathematical thinking in a more formal way.

KS1 & KS2 – Teaching of Mathematics:

When planning, teachers at Days Lane use the 'Days Lane Mathematics Curriculum Map' to ensure coverage of the National Curriculum objectives for each year group. The curriculum map organises the National Curriculum objectives into terms and provides a suggested time allocation (in weeks) for each area of maths.

When teaching for mastery, teachers focus on deepening children's understanding allowing children to explore, investigate and master mathematical concepts. Teachers plan more open-ended tasks and problem-solving questions to ensure that all children are challenged. It is important to acknowledge that the children who need more scaffolding, or need to be stretched, changes on a daily basis. As such, differentiation is achieved by going deeper into the learning objective before moving onto the next year group's content.

Teachers at Days Lane spend longer modelling a new concept at the start of the lesson so they can see the progress that each child is making and set appropriate tasks. By the end of the lesson, however, all children should reach the same point.

At Days Lane, our **learning sequences** include the following:

- At the start of each new topic, a pre-assessment is completed by each child and their results recorded.
- Key vocabulary is taught to develop children's understanding of mathematical terms and apply these in their reasoning
- Fluency skills meaning that children are able to move confidently between contexts and representations, recognise relationships and make connections.
- Deepening their understanding; fully understand, explore and apply ideas to real life situations.
- Multiple representations for all – concrete, pictorial and abstract. Together, these elements help cement knowledge so children truly understand what they've learnt.
- Problem solving and making connections between different ideas.
- Reasoning is key to building reasoning skills so they can verbally discuss with a partner how to solve a problem.
- Useful learning mistakes are identified and addressed.
- At the end each topic, a post-assessment is completed by each child and their results recorded.

## The CPA Approach:

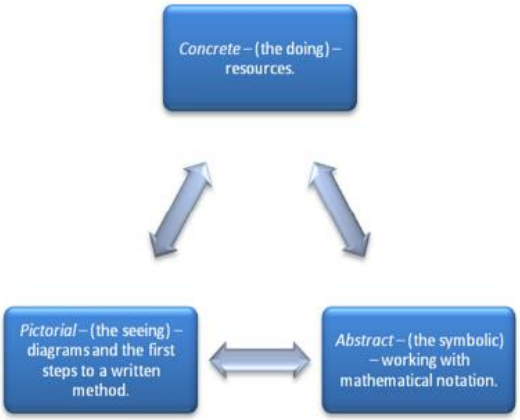
At Days Lane we adopt the Concrete, Pictorial, Abstract (CPA) approach as we believe that is a highly effective approach to teaching mathematics that develops a deep and sustainable understanding of maths in pupils.

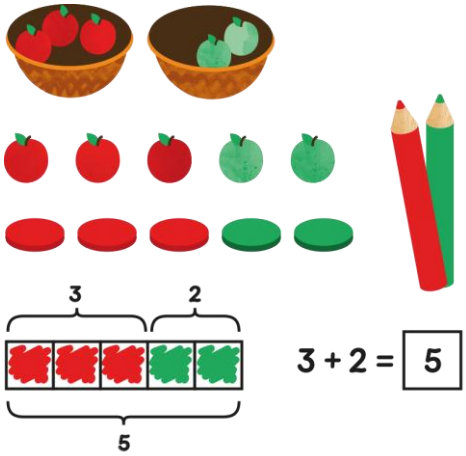
- An essential technique of maths mastery that builds on a child's existing understanding
- A highly effective framework for progressing pupils to abstract concepts like fractions
- Involves concrete materials and pictorial/representational diagrams
- It is an essential maths mastery strategy

**Concrete** – Is the "doing" stage. During this stage, pupils use concrete objects to model problems. The CPA approach brings concepts to life allowing children to experience and handle physical (concrete) objects. Every abstract concept is first taught using physical, interactive concrete materials.

**Pictorial** – Is the "seeing" stage. Here, visual representations of concrete objects are used to model problems. This stage encourages pupils to make a mental connection between the physical object they just handled and the abstract pictures, diagrams or models that represent the objects from the problem. Building or drawing a model makes it easier for children to grasp difficult abstract concepts (for example, fractions).

**Abstract** - Is the "symbolic" stage. Pupils use abstract symbols to model problems. Pupils will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem. The abstract stage involves the teacher introducing abstract concepts (for example, mathematical symbols). Children are introduced to the concept using only numbers and mathematical symbols (for example, +, –, x, /) to indicate addition, multiplication or division.




## Working Wall:

At Days Lane, every classroom has a 'Maths Working Wall' to support current learning through the CPA approach. It also includes a section with appropriate vocabulary and is referred to during lessons, where appropriate, to enhance and deepen children's understanding.

## Recording – Learning Template:

At Days Lane, children's independent work is presented on a learning template and each template has the following sections:

- Learning Objective and Steps to Success
- Model
- Fluency
- Applying
- Reasoning
- Challenge

Each section on the learning template is differentiated using the following 'Chilli' system:

**Level of Challenge**

At Days Lane, children choose which level of challenge they would like to tackle in each lesson and can move up or down through the chilli system within the same lesson.

Children have the opportunity to record in a variety of ways to show their current attainment they are working at; this will also allow progression to be seen. When working with the pictorial and abstract, recording will occur through written work within their book. When completing tasks, children are encouraged to show their working out, thus helping the teacher to identify any misconceptions. When working with the concrete, the evidence can come from photographs. Where appropriate, annotations of the children's learning is included alongside any photographs.

## Mental Maths:

All children regularly practice number bonds, counting skills and times tables.
Mental maths strategies are a key feature of every maths learning sequence. At Days Lane, children have four maths lessons in a week and one arithmetic lesson on the Friday.

Number bonds / Times tables and number fluency challenges are tested weekly and collated. In KS2, in addition to the maths lessons, children have two times tables lessons and the essential times tables skills are taught in a carousel of activities. Children must be secure on a set times table before moving to the next table. This is assessed in a variety of ways - tables facts, division facts, missing number, related number facts.

## Marking, Feedback and Assessment:

At Days Lane, children's work is marked daily to pick up any misconceptions and challenge children further. Work is marked against the success criteria, in line with the school's marking policy, and includes next steps. Children are encouraged to self-assess their work at the end of each maths lesson and are given time to read teachers' comments and make corrections or improvements. Children's responses to marking are made as close to the work as possible, ideally at the start of the next lesson.

Assessment is an integral part of teaching and learning and is a continuous process. Teachers make assessments of children daily through:

- regular marking of work
- identifying errors and addressing them through adult support
- asking questions and listening to answers
- listening to discussions
- making observations

These ongoing assessments and information gathered from the 'Show me what you know' inform future planning and teaching. Lessons are adapted readily and short term planning evaluated in light of these assessments.

## My Maths:

At Days Lane, we use a platform called 'MyMaths' which is a fully interactive online learning tool used by teachers to support mathematics learning at home. Children are set homework tasks on MyMaths in line with our Homework Policy and are encouraged to access it regularly at home to support areas of mathematical learning.