



## **Penshurst Maths Curriculum**

In our Early Years setting, we introduce Maths using Mastery Maths. The concept of Mastery Maths is to ensure pupils acquire a deep, long-term, secure and adaptable understanding of the subject.

The idea behind this is to make sure all children leave the Early Years setting with a solid understanding of the subject in order to move on to more advanced objectives as they transition into Key Stage One.

EYFS children will focus on a specific number per week, looking at it in great detail, from how it is written and its value, to how it is encountered in real-life situations (i.e. on a clock, in scores during a sports game, etc.). After learning about the number, this knowledge is then applied to real-life play contexts outside of the classroom environment.

When the children move to more formalised learning in Key Stage One, the curriculum focuses on the strands with heavier 'weighting' (i.e. those areas of Maths that contain the largest amount of objectives to learn).

To put this into context, in Year Two, there are 17 objectives to learn within the Number strand, whereas there are only 2 objectives to learn within the Fractions strand. Therefore, the Number strand and the Shape & Measure strand (which contains 15 objectives) will be focussed on a lot more than those strands with a lower 'weighting' in order to cover the larger amount of objectives.

## **CPA**

The formalised learning process focuses on the Concrete, Pictorial, Abstract (CPA) approach to mathematics. The CPA process is used to develop a deep and sustainable understanding of maths in our pupils. Maths is often a difficult subject due to its abstract nature (i.e. the use of many different digits, numbers and symbols). Our use of CPA builds on pupils' existing knowledge by introducing the abstract parts of mathematics in tangible or 'concrete' forms. We then move from concrete forms to pictorial representations, ending with the use of abstract mathematical symbols and problems.

### **Concrete phase**

This is the 'doing' stage of the CPA process. This is where concrete objects (such as counters, toys, marbles, fruit, etc.) are used to model problems. Instead of the teacher demonstrating how to solve a problem, this process allows children to handle the objects themselves to help understand methods and solutions. Every abstract of the concept is introduced in concrete form using physical, interactive resources.

An example of this would be a maths problem involving fruit which would be taught using actual pieces of fruit that the children can handle. From this point, children can then use manipulatives such as blocks or counters that represent the fruit.

## **Pictorial phase**

This is the 'seeing' stage of the CPA process. This is where visual representations are used instead of manipulatives. This stage allows the children to make the mental connection between the physical objects they used in the concrete process and the abstract pictures, diagrams or models they now see at this stage.

By building or drawing models, this enables children to visualise abstract problems, therefore making them more accessible.

## **Abstract phase**

The final stage of the CPA process is the 'symbolic' stage. This is where children use abstract symbols in maths problems. Children are only ready to move on to this section of the process once they have a solid understanding of the concrete and pictorial stages of the problems they encounter.

In this stage, teachers introduce children to abstract concepts (e.g. problems involving addition, subtraction, division or multiplication symbols). At this point, children are exposed to problems that only involve numbers, notation or mathematical symbols.

As children progress through the key stages of Maths they tend to move to the abstract section of the CPA process more frequently, but it is at the discretion of the teacher as to whether a child needs to build up from the concrete or pictorial stage before moving on to abstract problems.

Although the use of manipulatives in maths lessons is encouraged in all year groups when appropriate, they are more commonly used in EYFS and the Key Stage 1 phase of education as children's abstract understanding of mathematical concepts increases, the older they get.

## **Fluency, Variation, Reasoning & Mastery**

We ensure that children build on their existing knowledge for every objective by completing pre-assessments based on the objectives being taught on the day. Children's starting point in lessons is accurate as they are based on the question's children get correct or incorrect at the start of a lesson.

If children need to build confidence in an objective, they will first complete the Working Towards Expected task in a lesson, which is a simplified version of the objective being taught (for example, if the main objective of a lesson is adding 3-digit numbers, the Working Towards objective may be adding 2-digit numbers).

The Working At Expected task is a collection of questions, all based around the main objective of the lesson. The task comprises 12 questions that build up sequentially in difficulty.

### **Fluency**

The first 4 questions are Fluency questions, where the objective is met through basic questioning and children can choose the most appropriate method for this particular task.

### **Variation**

The next 4 questions in the Working At Expected task are Variation questions. These are questions that meet the objective but are presented in different ways to the first four Fluency questions. When it comes to formalised assessments, Maths questions can be presented in many different ways (for example, showing the answer box and equals symbol before the question, or calculations written in word form) so this section ensures children are subjected to question in a variety of ways.

### **Reasoning**

The final four questions in the Working At Expected task are Reasoning questions. In Maths, Reasoning is the process of applying logical and critical thinking to a mathematical problem in order to work out the correct strategy to use (and as importantly, not to use) in reaching a solution. The types of questions may come in the form of a word problem or a question which requires the child to think logically in order to get the correct answer (example of these would be questions asking if a statement is true or false, asking where someone made a mistake in a question or whether a particular method can be applied to every question linked to the objective). Reasoning can be viewed as the glue that bonds Fluency questions and problem solving (known as Greater Depth) questions together.

### **Problem Solving**

Once pupils have proven themselves as able to complete the Working At Expected task, they are then challenged with the Working At Greater Depth tasks, which is a selection of Mastery questions which involve the application of their knowledge in order to solve problems.

These can come in the form of worded questions or open-ended investigations which deepens their knowledge of the objective being taught. In order for a child to be assessed at working above their age-related expectations, they are expected to be able to confidently complete questions in the Working At Greater Depth tasks on a regular basis.

Children are challenged to work quickly and carefully through their Maths work to ensure sustained progress is made in lessons. With individual starting points based on their knowledge and ability, pupils gain the knowledge they require in order to effectively build on their previous learning.