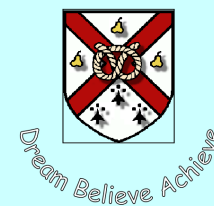




# What is Maths?



Maths is one of the core subjects in the Primary National Curriculum. It is a subject that is essential to every day life critical to Science, Technology, Engineering and essential for financial Literacy and nearly all forms of employment. A high quality Mathematics education is therefore very important as a foundation for the understanding of the world, the ability to reason mathematically, an appreciation of the power of Maths and above all a sense of enjoyment and curiosity of the subject.

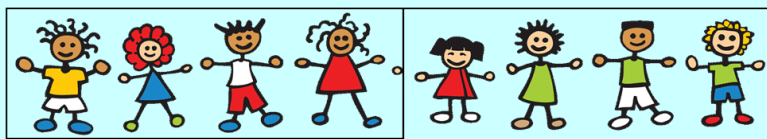




# Maths Vision



*At Perton First School all of our children are given the opportunity to develop their mathematical potential through a rich, engaging curriculum. We want our children to feel confident in using and applying mathematics in a wide range of situations. In maths we aim to develop lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future.*

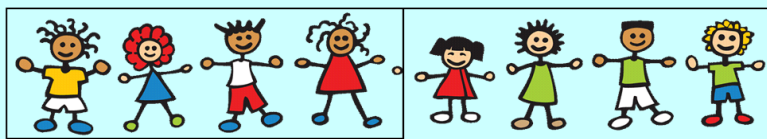




# Aims of Mathematics at PFS



- Develop the Mathematical skills essential for life in the twenty first century;
- Present maths as a challenging, exciting, creative and relevant subject
- Promote a positive and confident attitude towards Maths;
- Promote an enjoyment and enthusiasm for learning through practical activity, exploration and discussion;
- Develop the ability to solve problems through decision-making and reasoning in a range of contexts;
- Provide opportunities to apply mathematical learning to a range of real-life contexts in mathematics and in other subjects;





Dream Believe Achieve

# What will children learn?




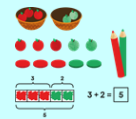
Dream Believe Achieve

EYFS	Key Stage 1	Lower Key Stage 2
<p><b>Number:</b> Children at the expected level of development will: - Have a deep understanding of number to 10, including the composition of each number; 14 - Subitise (recognise quantities without counting) up to 5; - Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.</p> <p><b>Numerical Patterns:</b> Children at the expected level of development will: - Verbally count beyond 20, recognising the pattern of the counting system; - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; - Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.</p>	<p>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 should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve 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 should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.</p>	<p>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 should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure 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. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.</p>

# How will children learn?

## Concrete Pictorial Abstract

The CPA approach helps children learn new ideas and build on their existing knowledge by introducing abstract concepts in a more familiar and tangible way.

Concrete	Pictorial	Abstract
<p>Concrete is the “doing” stage, using concrete objects to model problems. Instead of the traditional method of maths teaching, where a teacher demonstrates how to solve a problem, the CPA approach brings concepts to life by allowing children to experience and handle physical objects themselves. Every new abstract concept is learned first with a “concrete” or physical experience.</p> 	<p>Pictorial is the “seeing” stage, using representations of the objects to model problems. This stage encourages children to make a mental connection between the physical object and abstract levels of understanding by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem. Building or drawing a model makes it easier for children to grasp concepts they traditionally find more difficult, such as fractions, as it helps them visualise the problem and make it more accessible</p> 	<p>Abstract is the “symbolic” stage, where children are able to use abstract symbols to model problems (Hauser). Only once a child has demonstrated that they have a solid understanding of the “concrete” and “pictorial” representations of the problem, can the teacher introduce the more “abstract” concept, such as mathematical symbols. Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols, for example +, −, ×, ÷ to indicate addition, multiplication, or division.</p>

Although CPA has three distinct stages, the stages once understood should not be taught in isolation. Teachers will go back and forth between each representation to reinforce concepts. What is important, therefore, is that all learners, however young, can see the connections between each representation.



# How is Maths Taught?

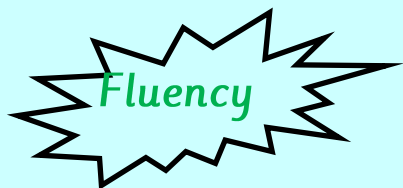


Mathematics is taught daily in school. In Reception a mathematical focus is taught each day, with adult led tasks, or choice provision available each week. The valuable skills taught in Maths are not just taught in isolation but used and applied in other areas of the curriculum.

A typical lesson would comprise of children practising fluency and the recall of facts, then being taught a new concept which would be introduced using the CPA approach. Children would then be given time to practise and embed this new learning through individual activities, group work, reasoning and problem solving. A very important part of Maths is that children are given the opportunity to talk about their Maths. Children need to be able explain the reason for the answer they have written down. Children are given 'Prove It' activities to assess their understanding.

Once children are confident using manipulatives they move onto representing their Maths using pictures and then finally to the written calculation. This CPA approach is used throughout all year groups.

As a school we use the Rising Stars Maths Scheme.





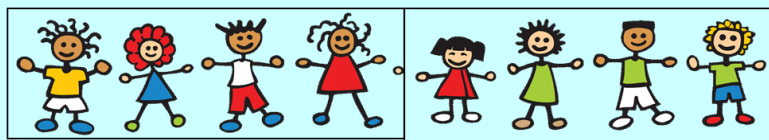


# How is Maths learning assessed?



*Teachers use a broad range of assessment tools, including standard tests, daily maths books and teacher assessment. NFER testing takes place at the end of each term and this alongside daily lessons informs teachers of the levels (emerging, developing, secure or mastering) that each child has achieved. These tools allow teachers to effectively monitor progress, target gaps in children's understanding and provide a tailored approach to their daily practice.*

*In the Early Years Foundation Stage, focused adult led learning tasks form the basis of the primary assessment, this is then consolidated through children accessing maths independently in the setting. These observations and achievements are assessed against the development matters working towards all children achieving a Good Level of Development by the end of the Reception year.*

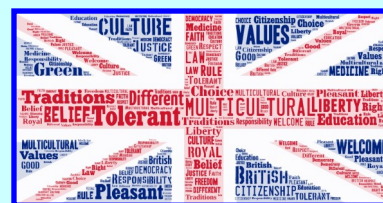




## How does it promote fundamental British Values?



The mathematics curriculum promotes the British values of acceptance and resilience on a daily basis through problem solving and understanding of complex concepts, encouraging children to persevere and try different methods to arrive at a correct solution. Teamwork through peer assessment and group work underpins the schemes of learning. Children work together in all areas of the maths curriculum to support each other and build mutual respect for one another. Children are allowed to make mistakes and learn from them in all maths lessons. This fosters confidence and builds self-esteem, it encourages children to take risks and become lifelong learners whilst using their mathematical skills in all aspects of life.







# How do we promote a Positive Maths



## Classroom

*Everyone can  
learn Maths to  
the highest level.*

*Maths is about  
making sense  
and creativity.*

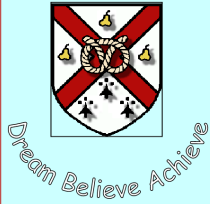
*Questions are  
really important.*

*Mistakes are  
Valuable.*

*Maths is about  
communicating and  
making connections*

*Depth is more  
important than  
speed.*

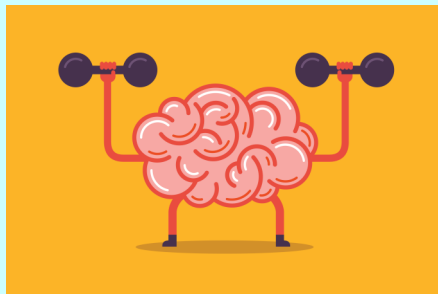
*Maths is about  
learning not  
performing.*

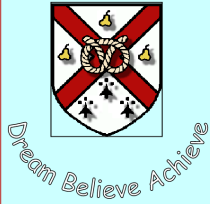


*Everyone can learn Maths to the highest level.*



- ♦ *We encourage our children to believe in themselves, as children need to believe they can achieve at any level.*
- ♦ *Children need to have a 'Growth Mindset', believing that they have the capacity to learn anything, and the more work that they do the smarter they can become.*
- ♦ *We praise what the children have done and learned.*





## *Mistakes are valuable.*



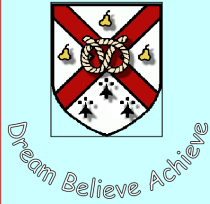
- ♦ *We tell our children that it is fine to make mistakes, when people make mistakes their brains are growing.*
- ♦ *If one child makes a conceptual mistake, there are probably many others making the same mistake. Children therefore can learn from each other.*
- ♦ *The message 'We learn from making mistakes' is a very valuable message for children.*



## Questions are really important

- ♦ We encourage our children to ask questions.
- ♦ Staff don't need to be able to answer every question that children may come up with, sometimes it is good to say that you don't know but you will find out, or ask other students if someone would like to answer the question.
- ♦ We write good questions on our 'Working Walls'



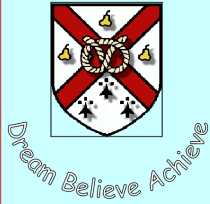


## *Maths is about Creativity and Making Sense*



- ♦ *The key to Maths is being able to make sense of it.*
- ♦ *Maths is a very creative subject. At its core it is about visualizing patterns and creating solution paths that others can see, discuss and critique.*
- ♦ *We show maths ideas through visual representations. This enables more children to access understanding of the concept being taught.*





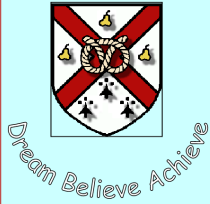
## Maths is about Connections and Communicating



- ♦ . Maths connects to other subjects children are taught and is a form of communication.
- ♦ We encourage our children to represent their Maths in different forms eg words, pictures, graphs etc.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100





*We value depth over speed*



- ♦ *Many people incorrectly think being good at Maths means being fast at Maths.*
- ♦ *Children need to think deeply, connect methods, reason and justify their thinking.*



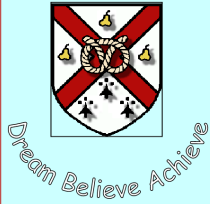
*How shall I solve it?*

*Mastery Maggie helps us to solve problems.*



*Why does it work?*

*Reasoning Ralph helps us to reason about our Maths.*



## *Maths is about Learning not Performing*



- ♦ *Many children think it is their role in Maths class is not to learn but to get questions correct– to perform.*
- ♦ *We teach our children to understand that Maths is about learning and to know that Maths is a growth subject. It takes time to learn and it is all about trying your best and working hard.*





# How does it promote SMSC?



## (Spiritual, Moral, Social, Cultural)

**S**-In mathematics pupils are always encouraged to challenge their understanding of Mathematics and how it relates to the world around them. The skills of analysing data are taught from years 2-6 to enable children to make sense of the vast amounts of data available in the modern world around them. They develop a fascination about how currency can be used in their everyday lives. Also life skills such as telling the time, reading measurements and scales are taught in exciting contextual lessons. Children are given the choice in many lessons regarding the numbers or methods that they use. They are also able to choose their own problems and begin to create their own. Within the Foundation stage children begin to explore shapes in the world around them and are able to talk creatively using mathematical language when constructing and describing models.

**M** -Within Mathematics children will recognise how logical reasoning can be used to consider the consequences of particular decisions and choices. Children explore a range of Mathematical investigations where they are challenged and made aware that there may be more than one solution. On the other hand, they are also aware that some problems require one correct answer. A variety of lessons and closing the gap comments require children to prove or explain whether an answer is right or wrong. This helps the children to learn the value of mathematical truth. Mathematical reasoning is developed through guided group work where the children are encouraged to talk about their learning and listen to other viewpoints.



# How does it promote SMSC? cont.....



## (Spiritual, Moral, Social, Cultural)

**S** -Problem solving skills and teamwork are fundamental to Mathematics, through creative thinking, discussion, explaining and presenting ideas. Throughout the key stages, children are provided with opportunities to work together productively on mathematical tasks and supported to see that the result is often better than any of them could achieve separately. Experimental and investigation work provides an ideal opportunity for children to work collaboratively.

**C** -Within Key Stage One and EYFS, children begin to understand the importance of counting and explore early counting ideas from other countries, such as tallies. In Key Stage Two, children begin to explore more developed number systems, such as Roman numerals. This supports the children to realise how our counting system has developed throughout the ages and shaped the decimal system that we use today.

