PURE MATHEMATICIANS JUST LOVE TO TRY UNSOLVED PROBLEMS - THEY LOVE A CHALLENGE. Responsibility Resilience Independence Curiosity Respect Kindness Honesty Self-belief

Pinewood Infant School and Foundation Unit

Together we give children the roots to grow and the wings to fly

Mathematics at Pinewood

Mathematics is essential in everything we count or calculate and in problems which we have to solve in our daily lives. Children's knowledge, skills and understanding in mathematics develop as they use it in practical activities, to solve relevant and meaningful problems and explore the patterns and relationships between numbers.

Our vision for Maths at Pinewood is that our children:

- Become **fluent** in the basic skills of mathematics such as number bonds, times tables and mental calculations.
- Can talk about maths; numbers, patterns and methods and use mathematical vocabulary to do so
- Have good **number sense** and are able to understand and use a range of strategies to solve different calculations
- Can reason about maths looking for patterns and relationships between numbers and calculations and explain their thinking
- Can solve problems by applying their mathematics to a variety of problems with increasing confidence, including breaking down problems into a series of simpler steps and persevering to find solutions.
- Have positive attitudes towards Maths and a bank of strategies to use and help them work with confidence, including using practical resources and drawing pictures.

What does Maths at Pinewood look like?

- We teach maths through a mastery approach where all children are taught through whole-class interactive teaching, with the aim for all pupils to work together on the same lesson at the same time.
- Maths lessons start with counting, retrieval practice and mental maths activities, essential for developing fluency skills
- Children then have daily maths talk activities to develop their ability to explain and reason about their thinking and understanding. This ties in with the work we are doing on improving children's working memory with retrieval practice and worked examples.
- Through carefully sequenced lessons children progress from modelled concepts to guided practice, then working independently.
- Greater depth questions challenge children who are ready to develop their thinking and apply their knowledge and reasoning skills to more complex problems.
- Resources and drawings are encouraged to support children's understanding and ability to solve calculations and problems with independence, confidence and resilience.





Mathematics at Pinewood

Maths topics throughout school

KS1

- Number number and place value
- Number addition and subtraction
- Number multiplication and division
- Number fractions
- Measurement
- Geometry properties of shape
- Geometry position and direction





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EYFS

- Numbers
- Numerical patterns







- British Money Coins Description of the second se
- Statistics

Lesson design KS1 EYFS

Fluency/Flashback/Maths talk/Guided practice and

modelling/Independent Practice (Fluency, Variation Depth)/Plenary

- Maths talk (link with improving working memory)
- Modelling and stem sentences
- Guided practice
- Independent practice
- Plenary

Daily fluency session in addition to Maths lesson in KS1 (EYFS – Summer Term)

In nursery our children learn through their play in continuous provision both inside and outdoors. They also have a 'dollop a day' Maths session as a whole class, following our school mastery approach.



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Fluency

0+0

1+0

2+0

3+0

4+0

5+0

6+0

7+0

8+0

9+0

0+1

1+1

2+1

3+1

4+1

5+1

6+1

7+1

8+1

9+1

0+2

1+2

2+2

3+2

4+2

5+2

6+2

7+2

8+2

9+2

0+3

1+3

2+3

3+3

4+3

5+3

6+3

7+3

8+3

0+4

1+4

2+4

3+4

4+4

5+4

6+4

7+4

0+5

1+5

2+5

3+5

4+5

5+5

6+5

Facts within 5 - EYFS	Facts within 10 – Y1	Facts bridging 10
1. Representing and recognising 10 on a tens frame	7. Adding 2 to an even number (6+2)	15 Adding 10 to a number (5+10) (15-10)
2. Number songs - how many? Number songs 1 more/ 1 less (First steps to partition numbers/ groups Teacher to scribe the numbers/ show number)	 Adding 2 to an odd number (7 +2) 	16.Doubles up to 10 (7+7) (14+7)
 Separate a small group of objects in different ways recognising the total remains the same (Start with groups of 3,4 and 5) 	9. Adding 0 to a number (3+0) (3-0)	17 Near doubles up to 10 (8+7)
4. 1 more/ adding 1 (3+1)	10. Number bonds to 10 (6+4) (10- 4)	18 Bridging 10 (8+4) (12-4)
5. 1 less/ subtracting 1 (4-1)	11. Near number bonds to 10 (6+3)	19 Number in the middle (6 + 8)
6.Number facts to 5 (3+2, 4+1)	12. Double up to 5 (3+3)	20 Adding 9 by making 10 a ten - compensating (7+9) (16-9)
	13. Near doubles up to 5 (4+5) (9-4)	
	14.Number in the middle (3 +5)	

Regular teaching and practice of 'Fluency Facts'

Weekly problem solving and pattern spotting activities to encourage application of fluency skills in real-life contexts

0+7

1+7

2+7

3+7

4+7

0+6

1+6

2+6

3+6

4+6

5+6

0+8

1+8

2+8

3+8

0+9

1+9

2+9

0+10

1+10

2+10



In a certain city houses had to be built in a particular way. There had to be 2 rooms on the ground floor and all other rooms had to be built on top of these. Families were allowed to build just one room for each person living in the house. So a house for 2 people would look like this:



but a house for 3 people could look



0

ou are going to make Robot Monsters.				
lere are their	heads which	all have blue	backgrounds:	



Here are their bodies which all have yellow backgrounds



Here are their legs which all have green backgrounds:



Progression of Mental Addition and Subtraction



<u>Maths Interventions at</u>

<u>Pinewood</u>

- Pre-teaching and further support during inputs for children lacking confidence
- Maths after school club (Yr 1/2– Summer Term)
- Y1 and Y2 -Afternoon intervention groups/feedback sessions for children needing recap or support on current maths topic



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<u>Rewards/celebrations and special</u> promotions

- Friday golden star -can be linked to any area of the curriculum where children have worked hard, succeeded, persevered etc. often linked to maths.
- Pinewood person values awards linking values with different areas of the curriculum e.g. maths and resilience or self belief
- Showing work to Ms Otter Staff send children with impressive work to Ms Otter - Head Teacher sticker.



Staff Continuing Professional Development

- Termly staff meetings to cascade training from termly co-ordinator network meetings and share ideas and tips to support staff,
- Regular monitoring of maths through learning walks, book looks, planning scrutiny
- Whole school calculation policy to demonstrate the concrete- pictorial-abstract approach for different calculations working step by step through the four number operations
- Marking policy refresher every September or just for new staff depending on priorities



<u>Maths for parents and wider community</u> Website:

- Maths page maths overview, long term plans and policies
- Calculation policy on maths page breaks down methods used in school
- Links to useful maths resources on class pages



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<u>Resources to help children</u> 100 squares, number tracks, number lines, number



formation sheets Numicon – manipulatives to develop children's understanding of number and different maths concepts. Numicon guides children through concretepictorial- abstract approach Tens frames (and stamps) – supports children's visualisation of numbers to 10 then 20. Also used for addition and subtraction. (Concrete and pictorial) Counting resources – such as cubes, counters, sorting animals etc. used for counting and in conjunction with tens frames and part-part-whole models for composition of numbers. Also use to support calculations using the 4 number operations $(+, -, x, \div)$

Part-part-whole models – Supports composition of numbers, place value, addition and subtraction and missing number problems. (Concrete and

pictorial)

Dienes – invaluable resources to support place value, addition and subtraction using concrete resources. Children progress to pictorial approach by drawing their own **tens**

and ones.







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This policy demonstrates through worked examples how we teach each of the four number operations using concrete-pictorial-abstract.

We recommend using a wide variety of manipulatives, drawings and jottings to build and develop understanding and skills.







Concrete	Pictorial	<u>Abstract</u>
Combining two parts to make a whole	Children to represent the cubes using dots	4 + 3 = 7 four is a part, three is a part and the whole is
teddies, numicon etc.	part whole model too.	seven
		4 7 3

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EYFS – Number rhyme display, weekly working wall with focus activity, Maths area in continuous provision

KS1 – Working Wall with topic focus, vocabulary, strategies, worked examples

 Record of learning including toolkits of strategies learnt for different operations
 Learning Pit – To encourage growth and positive mindset and resilience.















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<u>Memory in Maths</u>

Retrieval Practice

• Flashback 4

In Key Stage 1, children complete daily 'Flashback 4' style activities (retrieval questions to recall from different stages of children's prior learning)



In F2 and Year 1/2, daily Maths Talk sessions aim to encourage discussion between children, retrieving prior knowledge required to move forward in the current lesson. Children are encouraged to use and apply existing knowledge of mathematical language in their discussions.



Maths Talk