Bligh Primary
A School with Heart

The Journey to becoming a Mathematician

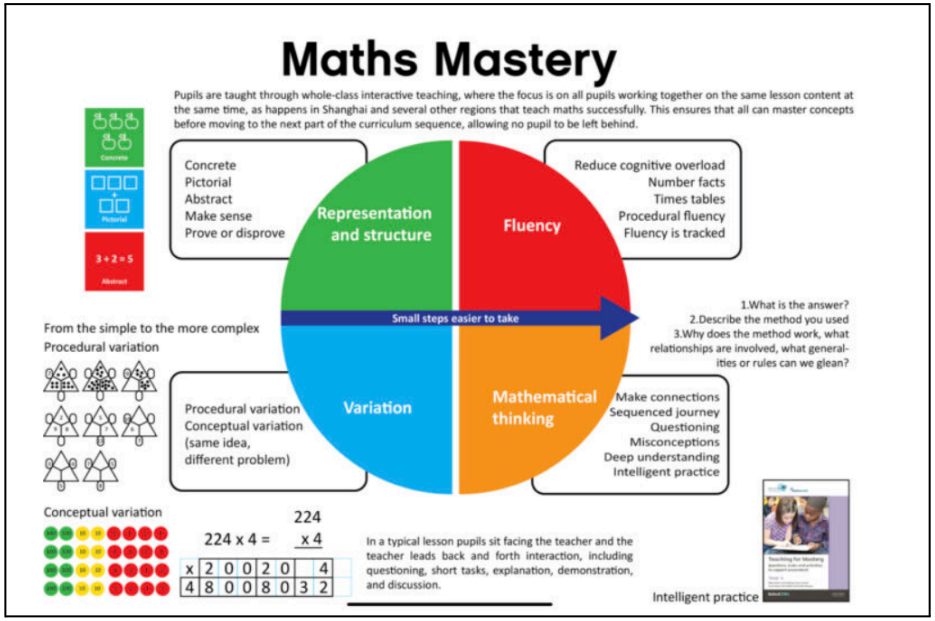
Rationale

This document builds on the whole school Maths Policy to support teachers to plan, teach and assess Mathematics in Early Years and KS1. Our aim is that maths learning is effective and meets the needs of all children so that they acquire a deep, long-term, secure understanding of the subject, thus ensuring they are Junior Ready and ultimately 'Secondary Ready' in Mathematics.

Pedagogical Approach

As in other curriculum areas there is a trinity of approaches which includes gradual release of responsibility, retrieval practice and CPA approach. These approaches provide a thread of consistency throughout the school.

- In maths this is underpinned by maths mastery.
- There will be daily dedicated maths lessons, and deliberately planned opportunities to learn and apply maths throughout the day. e.g registration on 10's frames, highlighting time during day, maths within the environment.
- We want all children to acquire a deep conceptual understanding in mathematics and this is supported by using a range of manipulatives. These are carefully thought through and progressive through the key stages. Calculations Policy.here



- Children will be encouraged to represent their ideas in their own ways to deepen their understanding, this will come before abstract teaching.
- Fundamental to our maths pedagogy is planning in time for mathematical talk providing opportunities to use mathematical vocabulary and providing opportunities to articulate their maths thinking
- Assessment for learning is the key tool for ensuring learning is embedded and identifying misconceptions and gaps. These will be addressed swiftly with a targeted keep up, catch up approach.
- We will offer support to parents to help them with their child at home.

Assessment in Mathematics

Assessment and feedback are vital tools for teachers in supporting children to learn and for this learning to become embedded and applied with confidence. Children need to be secure in procedural (methods and procedures) and declarative(facts, concepts) knowledge, these can then be applied to solve mathematical problems.Assessment is an ongoing process and takes two forms

1. formative assessment

2. summative assessment

Formative Assessment-**(** Assessment for Learning) :This is likely to be in the moment and responsive to teaching.

It may include

- high quality questioning
- a reflective conversation with a child to encourage the child to articulate and reflect on their thinking
- adaptation and variation of a question to challenge and check understanding
- low stakes quizzing e,g flashback 4 etc
- in the moment marking, peer or self marking
- identifying gaps and misconceptions- these are recorded on a maths assessment sheet maths weekly assessment Yr 2/ 1 and or priorities for learning sheet yr R/1
- feedback which is clear and precise - moving learning on over time

Summative Assessment: This is used to inform teachers of learning that is becoming embedded and is deliberately planned for. At Bligh this includes

- baseline and assessment against principles of counting for EYFS and Year 1
- End of unit assessments - White Rose(Yr 2)
- NFER maths assessments x 3 a year (Yr 2) and spring Yr 1
- These will be gap analysed and discussed at pupil progress and inform planning and interventions.

Progression of Maths Skills

This table gives a broad overview of the progression of maths learning from Nursery to Year 2.
The small steps for these can be found on year group overviews and links to calculation policy with vocabulary links

Nursery Progression Overview
Reception Progression Overview
Year 1 Progression Overview
Year 2 Progression Overview

maths progressions to support gaps/misconceptions/ targeted support:
counting skills and behaviour
operations skills and behaviours
shape and measure skills and behaviours

Broad Overview of Progression

Based on Learning Trajectories

Beginning By end of Nursery	Early Mathematician By end of Reception	Developing Mathematician By end of Year 1	Developing Mathematician End of Year 2
COUNTING Can verbally count with separate words- **stable order** Can verbally count to 10 with some correspondence with objects (may point to objects to count a few items but then lose track.) Can keep **one to-one correspondence** between counting words and objects , for small groups in a line. May answer "how many" by recounting the objects starting over with one each time. Join in with rhymes and show fingers to represent an amount. Can compare collections that are quite different in amounts- using more	**COUNTING** Can say the number names to 10 in the correct order.- **stable order** Can count structured arrangements of objects to 10. They may be able to write or draw to represent 10 and can accurately count a line of nine blocks and says there are 9. **Cardinality and 1 to 1 correspondence** Can also find the number just after or just before another number To count past 10 Points accurately to each item as they say a number name when asked how many- **cardinality** Know how many a group of objects has **cardinality**	**COUNTING** Can count out objects accurately to 10 and then beyond to 30. Can keep track of objects that have and have not been counted, even in different arrangements. - **conservation** Can write or draw to represent 1 to 10 and then 20 and 30. These children can recognize errors in others' counting and are able to eliminate most errors in own counting.- **stable order** Can determine immediately the number just before or just after another number without having to start back at 1.- **movement is magnitude** Knows how many are in a set (up to 6) without counting- **subitise**	**COUNTING** Can count by tens to 100. They can count through decades knowing that 40 comes after 39, for example. Can count by ones through 100, including the decade transitions from 39 to 40, 49 to 50, starting at any number. Can count mental images of hidden objects. Can count unusual units such as "wholes" when shown combinations of wholes and parts. For example when shown three whole plastic eggs and four halves, a child at this level will say there are five whole eggs. Can counts accurately to 200 and beyond, recognizing the patterns of ones, tens, and hundreds

Child can identify that different arrangements of the same number **conservation** Can match small, equal collections of dissimilar items, such as shells and dots, and show that they are the same number **conservation** Beginning to compare groups of 1–6 by matching. **one to one correspondence** Can make collection the same as another e.g when shown a collection of three, makes another collection of three.- **conservation** **OPERATIONS** Understand the meaning more (1) Will be able to say which group has 'more' May answer "how many" by recounting the objects starting over with one each time. Can compare 2 groups of objects and say which one has more Separates a group of 3 or 4 objects, knowing the total is still the same.	Knows that numerals represent an amount-and matches to amounts. Counts things that cannot be moved. - **abstraction** Children make accurate comparisons via counting. Beginning to work out difference/ how many more or less. - **conservation** Can compare and order (1–6, then beyond). For example, given towers of cubes, this child can put them in order or given cards with one to six dots on them, puts in order. **Movement is magnitude** Can count backwards from 10. Can use ordinal numbers Can instantly recognises collections – **perceptual subitise** up to five **OPERATIONS** Can order and compare numbers, next number in a sequence. Understands in whole and parts e.g 3 red and 2 blue blocks – all blocks.	**Conceptually subitise** e.g, a child at this level would say, "I saw 2 and 2 and so I saw 4." A child at this level likes to do number problems e.g. adding and taking away, how many ways can you arrange…. Can use internal images and knowledge of number relationships to determine relative size and position. For example, the child can determine whether 4 or 9 is closer to 6. Can count in 2's and 5's. Can count in 10's **OPERATIONS** Can name number bonds to 10. Can solve missing number problems e.g 5+_=7 Understanding that operations are related to each other (e.g. adding and then removing items means that the amount is the same) Adding without objects either out loud or in their heads	Can compare numbers with place value understandings. For example, a child at this level can explain that "63 is more than 59 because six tens is more than five tens even if there are more than three Can compare and order when they can use mental images and knowledge of number relationships, including ones embedded in tens, to determine relative size and position. For example, a child at this level when asked, "Which is closer to 45, 30 or 50?"says "45 is right next to 50, Can verbally label structured arrangements up to twenty, shown only briefly, using groups. For example, the child may say, "I saw three 5s, so 5, 10, 15." **conceptual subitising** Can use skip counting and place value to verbally label structured arrangements shown only briefly. For example, the child may say, "I saw groups of tens and twos, so 10, 20, 30, 40, 42, 44, 46 . . . 46!" 81 Can use flexible strategies and derived combinations (for example, "7 + 7 is 14, so 7 + 8 is 15") to solve all types of problems. For example, when asked, "What's 7 plus 8?" this child thinks: 7 + 8 -> 7 + [7 + 1] -> [7 + 7] + 1 = 14 + 1 = 15.

Begins to make comparisons between quantities. Uses come language of quantities such as more and a lot Knows that a group of things changes in quantities when something is added or taken away. **SSM** Can match shapes Next step is to match same shape of different sizes and orientations. Beginning to name some common shapes using everyday vocabulary e.g circle, square Can make a shape with sticks etc. Can make a picture with shapes. Can begin to recognise a pattern Understands idea of the same and different. Can sort by 1 criteria Can use size vocabulary of size e.g I am tall, but not always accurately. Can use positional language	Knows whole is bigger than the parts. Understands part-part-whole model Adding with objects, using counting to find the total. Subtracting with objects by counting what is left. Uses language to describe the relationship between quantities (more/less) **Movement is magnitude** To know number bonds up to 5 by recall Uses the language of adding and subtracting in practical activities Adding by counting on using objects Subtracting by counting back objects Using counting to share and group objects **Partitioning** Finds 1 more or 1 less from a group of 5 objects. Begins to identify their own mathematical problems	Can count on or back in head to solve problems. Subtracting without objects either out loud or in their heads Solve practical problems involving combining groups of 2, 5 or 10 Can choose from a range or combination of strategies to solve a problem (e.g. counting, using objects, recalling facts or combining facts to get the answer) Understanding the meaning of mathematical symbols (- + = < >) Begin to understand the meaning of mathematical symbols x and / Can apply their mathematical knowledge in the world around them **SSM** Uses language of comparison in measure. e.g longer, longest, longer Beginning to measure using standard units. E.g cm, kg, Can solve practical problems with measures.	**OPERATIONS** A child at this level can also solve multi digit problems by incrementing or combining tens and ones Can understand the inverse relation between divisor and quotient. For example, this child understands “If you share with more people, each person gets fewer.” Developing an understanding in multiplication and division they begin to use skip counting for multiplication and for measurement division (finding out how many groups). For example, given twenty blocks, four to each person, and asked how many people, the child skip counts by 4, holding up one finger for each count of 4. Can use a range of strategies to solve problems (+-<>x-) **SSM** can relate size and number of units measure with cm, metres, grams, kilograms, millilitres, litres etc. ” knowing the need for identical units, the relationships between different units, partitions of unit, and zero point on rulers.

Uses everyday language to describe shapes. E.g round, big Anticipates key events	To solve problems including doubling, halving and sharing. Records, using marks they can interpret and explain Automatic recall of doubling facts Explore how quantities can be distributed equally. A child at this level can count forwards and backwards Can do number problems practically e.g. adding and taking away, how many ways can you arrange **SSM** Can compare objects e.g longer, heavier. Can compare objects with a third e.g longer than, shorter than a piece of string Measures with non standard units Can copy patterns and extend them Can create own patterns and talk about them.	Can explain what makes 2D shape and 3D shape Can describe shapes by their properties e.g triangle has 3 sides, 3 corners etc Can split shapes into smaller parts and shapes. Recognises some times e.g o'clock, half past	Can measure accurately. Can read scales

	Can describe a shape using mathematical language e.g corners, edges, Uses mathematical names to name shapes. Children can turn an object to fit a space. Use everyday language related to time		