Mountbatten Primary School

Maths Policy

1	Summary	Maths Policy			
2	Responsible person	Chris Gatenby			
3	Accountable SLT member	Jamie Wegg			
4	Applies to	☒All staff ☐Support staff ☐Teaching staff			
5	Who has overseen development of this policy	Jamie Wegg			
6	Who has been consulted and recommended policy for approval	LGB			
7	Approved by and date	Autumn 2023 – Governing board.			
8	Version number	1			
9	Available on	Every	☐Y ☒N	Trust website Academy website SharePoint	☐Y ☒N ☒Y ☐N ☒Y ☐N
10	Related documents (if applicable)				
11	Disseminated to	☒Trustees/governors ☒All staff ☐Support staff ☐Teaching staff			
12	Date of implementation (when shared)	September 2023			
13	Consulted with recognised trade unions	☐Y ☒N			

Maths Policy Contents List

1. Introduction

Mathematics teaches children how to make sense of the world around them through developing their ability to calculate fluently, reason and solve problems. It enables children to understand relationships and patterns in both number and space in the world around them. Through their growing knowledge and understanding, children learn to appreciate the development and application of mathematics. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment.

2. Aims

The aims for teaching mathematics at Mountbatten Primary School are:

- To become fluent in the fundamentals of mathematics so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- To reason mathematically by following a line of enquiry.
- To promote enjoyment and curiosity of learning through practical activity, exploration, investigation and discussion.
- To understand the importance of mathematics in everyday life.
- To develop children's ability to move between concrete, iconic and symbolic representations fluently and confidently.
- To promote confidence and competence with understanding and using numbers and the number system.
- To develop a practical understanding of the ways in which information is gathered and presented.
- To explore features of shape and space, and develop measuring skills in a range of contexts.
- To enable children to select and use a range of mathematical tools effectively.
- To promote and provide opportunities for children to develop the core learning skills of confidence, determination, curiosity, aspiration, teamwork, independence, communication and focus.
- To develop sustainable learning for pupils for the future.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity organised into distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects. Children should learn that mathematics will frequently help them to solve problems they meet in everyday life or understand better many of the things they see and provide opportunities for them to satisfy their curiosity and to use their creative abilities.

The children at Mountbatten Primary school should feel confident that they belong to a school where they can solve mathematical problems as they arise. They should feel pride in preparing mathematical work for other classes to share. Their work might be used as part of their own maths lesson, by classes in other year groups, as part of school assemblies or for use on display boards, the website or social media sites.

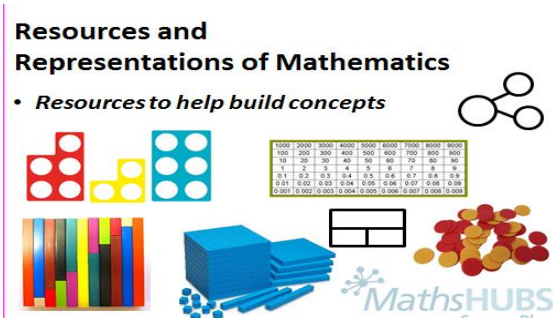
3. Teaching and Learning style

Maths Mastery

At Mountbatten we take a Maths Mastery approach. Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics; the large majority of pupils (with an exception of SEND pupils) progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through questioning, individual support and intervention. Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge. Maths Mastery lessons must be taught 5 times a week. **Each lesson is 1 hour**. In addition to this, a Maths across the Curriculum lesson must be taught each week driven throughout other Curriculum areas. However, if a circumstance arises where a maths lesson is missed due to theme days etc. it is a non-negotiable to teach a minimum of 4 Maths Mastery lessons a week.

CPA Model

It is important you provide the children with a variety of different ways to access and understand mathematical concepts. Mathematics is an abstract subject, representations have the potential to provide access and develop understanding. A representation needs to pull out the concept being taught. It exposes the underlying structure of the mathematics. Children have difficulty accessing abstract concepts – like the value of a number compared to the written numeral. Success can be achieved by experiencing three stages of representation: Concrete (Numicon, Cuisenaire rods, Base 10, tens frames, counters etc.), Pictorial (Part-Part- Whole model, Bar modelling etc.) and Abstract (Formal methods).



Fluency, Problem Solving and Reasoning:

Fluency, problem solving and reasoning is the vehicle which drives deeper understanding. This must help to focus and plan the teaching of maths.

Fluency

Fluency rests on a well-built mathematical foundation with three parts: an understanding of the meaning of the operations and their relationships to each other -- for example, the inverse relationship between multiplication and division; the knowledge of a large repertoire of number relationships, including the addition and multiplication "facts" as well as other relationships, such as how 4 × 5 is related to 4 × 50; and a thorough understanding of the base ten number system, how numbers are structured in this system, and how the place value system of numbers behaves in different operations -- for example, that 24 + 10 = 34 or 24 × 10 = 240.

Fluency involves: quick recall of facts and procedures; the flexibility and fluidity to move between different contexts and representations of mathematics; and the ability to recognise relationships and make connections in mathematics.

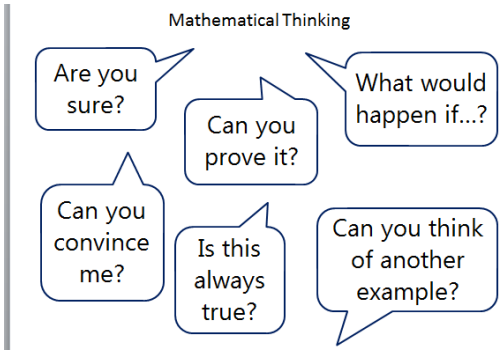
It's vital that children get to be fluent with their mathematical facts and procedures because it allows them to apply their mathematical understanding to solve problems.

Problem Solving

Children must solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions. Pupils must be encouraged to identify, understand and apply relevant mathematical principles and make connections between different ideas. This builds the skills needed to tackle new problems, rather than simply repeating routines without grasping the principles.

Reasoning

Children must reason mathematically by following a line of inquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language. Reasoning can be supported through use of the following sentence stems:



Here are some examples of types of reasoning:

- Describing: I can describe what I did.
- Explaining: I can offer some reasons for what I did.
- Convincing: I am confident that my reasoning is correct (even if it's not!) and can try and convince you that I'm right.
- Justifying: I can use words like, "therefore," "that leads to" to justify a correct logical argument with a complete chain of reasoning.
- Proving: I can make a watertight argument that is mathematically sound.

It is a non-negotiable that reasoning should be clearly evident in books on a weekly basis. Children who are unable to write their reasons may use a scribe for their oral reasoning.

Variation

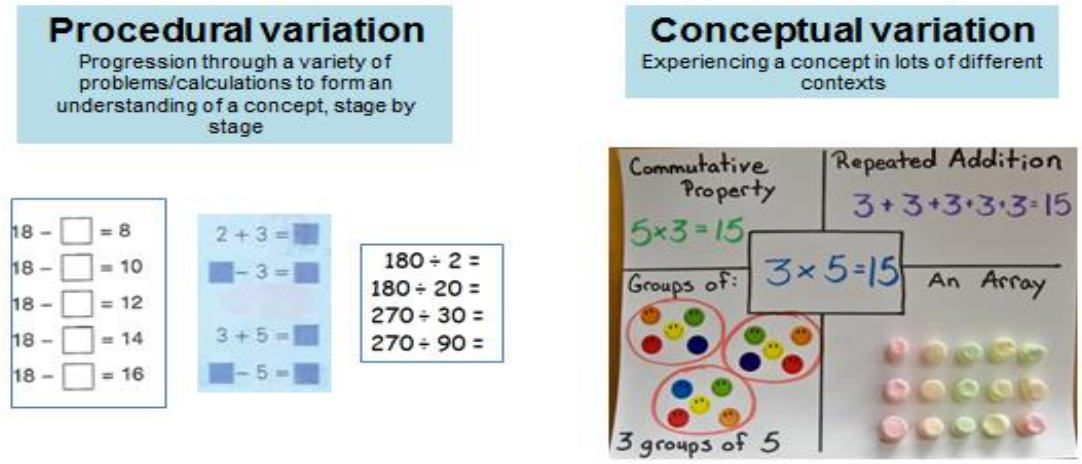
Purpose of Variation:

- Supports deep learning by providing rich experience rather than superficial contact
- Provides the necessary consolidation (in familiar and unfamiliar situations) to embed and sustain learning
- Focuses on conceptual relationships and make connections between ideas
- Supports pupils' ability to reason and to generalise

There are two types of variation: Procedural variation and Conceptual variation. You must overlap between the two.

Procedural variation provides the opportunity for practice (intelligent rather than mechanical); to focus on relationships, not just the procedure; to make connections between problems; to use one problem to work out the next; to create other examples of their own.

Conceptual variation means to develop an understanding of mathematical concepts from multiple perspectives. Conceptual variation also draws attention to what something is as well as what it is not.



4. Mathematical Vocabulary

The 2014 National Curriculum is explicit in articulating the importance of children using the correct mathematical language as a central part of their learning. Indeed, in certain year groups, the non-statutory guidance highlights the requirement for children to extend their language around certain concepts. It is therefore essential that teaching using the strategies outlined in this policy is accompanied by the use of appropriate mathematical vocabulary. New vocabulary should be introduced in a suitable context (for example, with relevant real objects, equipment, pictures or diagrams) and explained carefully. High expectations of the mathematical language used are essential, with teachers only accepting what is correct.

The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. In order to develop mathematical vocabulary, it is imperative that all adults model this appropriately using sentence stems to scaffold the correct language (e.g. I think this because; If this is true then; I know that the next one is….. Because; this can't work because; When I tried….I noticed that; the pattern looks like).

5. Maths No Problem

Singapore Maths is a mastery approach to teaching which has produced a world-class level of achievement for many years. Singapore students scored first in the past three Trends in International Mathematics and Science Studies (TIMSS). These studies are conducted by the International Association for Evaluation of Educational Achievement (IEA). Singapore's 4th and 8th grade students scored top place for Mathematics in 1995, 1999, 2003 and 2007. The Department for Education, the National Centre for Excellence in Teaching Mathematics (NCETM), the National Curriculum Review Committee and OFSTED have all emphasised the pedagogy and heuristics developed in Singapore. Today, maths textbooks based on the Singapore Maths approach are being used in thousands of schools across the UK and have been widely adopted by the Department for Education's Maths Hubs. We have chosen to use Maths No Problem. The Maths No Problem! Primary Series was assessed by the DfE's expert panel, which judged that it alone met the core criteria for a high-quality textbook to support teaching for mastery. The whole class works through the programme of study at the same pace with ample time on each topic before moving on. Ideas are revisited at higher levels as the curriculum spirals through the years. Tasks and activities are designed to be easy for pupils to enter while still containing challenging components. For advanced learners, the textbooks also contain non-routine questions for pupils to develop their higher-order thinking skills. Lessons and activities are designed to be taught using problem-solving

approaches to encourage pupils' higher-level thinking. The focus is on working with pupils' core competencies, building on what they know to develop their relational understanding, based on Richard Skemp's work. Based on Jerome Bruner's work, pupils learn new concepts initially using concrete examples, such as counters, then progress to drawing pictorial representations before finally using more abstract symbols, such as the equals sign. The questions and examples are carefully varied by expert authors to encourage pupils to think about the maths. Rather than provide mechanical repetition, the examples are designed to deepen pupils' understanding and reveal misconceptions.

6. Times tables lessons

The teaching of times tables at Mountbatten

'It is not terrible to remember maths facts; what is terrible is sending kids away to memorise them and giving them tests on them which will set up this maths anxiety.' – Prof Jo Boaler, Stanford University

What content each year group needs to teach

1. Clarify how your current core offer TEACHES the appropriate times tables per year group

a. Y1 Make connections between arrays, number patterns, and counting in tows, fives and tens

b. Y2 Recall and use multiplication and division facts for the 2,5 and 10 multiplication tables (they connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face)

c. Y3 Recall multiplication and division facts for the 3, 4 and 8 multiplication tables (through doubling, they connect the 2, 4 and 8 multiplication tables)

d. Y4 Recall multiplication and division facts for multiplication tables up to 12 x 12 (TEACH 6s, 7s, 9s, 11s and 12s)

e. Y5/6 The National Curriculum expectation is that by the end of Year 4, children are able to recall all 12 tables up to 12x12. Teachers to use assessments to identify focus tables.

Approach to teaching

2. Develop a clear systematic and discrete approach to explicit TEACHING and frequent DELIBERATE practise of times tables in addition to your core offer

a. Use of times tables stick for TEACHING of times tables

b. TEACH a range of strategies that children can fall back on

i. Landmark numbers (1, 5 and 10):

ii. X5

iii. X6 (add 1st multiple)

iv. X7 (add 2nd multiple)

v. X10

vi. X11 (add 1st multiple)

vii. X12 (add 2nd multiple)

viii. X9 (subtract 1st multiple)

ix. Doubles:

x. X1

xi. X2

xii. X4

xiii. X8

xiv. X3

xv. X6
xvi. X9
xvii. X12
xviii. E.g. Start with doubles:
xix. 1- X1 landmark
xx. 2- X2 (double 1st multiple)
xxi. 3- X4 (double 2nd multiple)
xxii. 4- X8 (double 4th multiple)
xxiii. 5-X3 (add 1st multiple to 2nd multiple)
xxiv. 6- X6 (double 3rd multiple)
xxv. 7- X10 landmark
xxvi. 8- X11 (add 1st multiple to 10th multiple)
xxvii. 9- X12 (add 2nd multiple to 10th multiple)
xxviii. 10- X9 (Subtract 1st multiple from 10th multiple)
xxix. 11- X5 landmark (Half 10th multiple if needed)
xxx. 12- X7 (add 2nd multiple to 5th multiple)
xxxi. Use in conjunction with arrays:
xxxii. Tens frames and counters
xxxiii. Numicon

Intervention

3. Plan intervention based on children in the lowest 20%
a. NOT Times table rocks stars
b. Use of key strategies explained above for tables they are struggling on with the support of CPA models
c. What's missing
i. Start with a stick with all facts on. Teacher/partner takes a card off without the other seeing. Partner says the fact that's missing. Partner wins the card if they say the fact quickly and correctly. If the fact is wrong or still tricky the card goes back on the stick. The aim is to eventually 'win' all of the cards and to empty the stick
d. Find the fact
i. An empty stick with a full set of tables cards. Player 1 points to any section of the empty stick. Player 2 states the fact. If correct the card is put on the stick. The aim is to fill the stick as quickly as possible. Try to make it a competition to beat their best times.
e. Use of Times table stick to support direct and discrete teaching of Times tables

Practise

4. Plan for weekly protected practise time for the recall of times tables
a. This time is solely for practise, recall and fluency
b. This could be TTR or hit the button etc
c. DELIBERATE practise within TTR: Teachers to set table and schedule tables throughout the year so that children are not always given exposure to up to 12 X 12

Assessment

5. Assessment and analysis
a. Develop a way of recording children's progress
i. Use spreadsheet which calculates progress percentages and mean scores for cohorts and individual children.
ii. Weekly soundchecks to closely align with MTC to be completed from year 2-6.
iii. Use of TTR data analysis bolt on allows teachers and leaders to identify weaknesses at year group/class/individual level which then can be used to teach and intervene to gaps in tables or particular facts.

Times tables lessons are to take place once a week in KS1 for 30 minutes. In KS2 Times tables lessons will be taught twice a week for 15 minutes.

7. Mathletics

Mathletics must be taught during morning registration. In this time children will be given opportunities to practise and consolidate skills from previous weeks/days learning. This can also be used as an opportunity to pre-load children in preparation for a concept. Children may self-mark but this always must be checked by the teacher and ticker or highlighted. This will form part of an evidence base for maths moderation. KS1 – A Mathletics session during registration, a 1 x hourly Maths Mastery lesson and 1 30 minute Times table lesson a week. Mastering number sessions are done 4 times a week for 15 minutes.
KS2 – A Mathletics session during registration, a 1 x hourly Maths Mastery lesson and a 10-15 minute Times table lesson 2 times a week.

8.Times Table Rock Stars

Times Tables Rock Stars is a carefully sequenced online programme of daily times tables practice. Each week concentrates on a different times table, with a recommended consolidation week for rehearsing the tables that have recently been practised every third week or so.

Years 3-6 complete weekly sound check so that support can be adapted to meet the needs of all children.

9.Mastering Number

The National Curriculum places a great emphasis on mental recall. At Mountbatten Primary School, we have incorporated a daily Mathletics, Times tables lessons as previously mentioned. alongside this we have and Mastering number sessions into the daily routine.This programme focuses on the key knowledge and understanding needed in Reception classes, and progression through KS1. In KS2 the focus of mastering number is on knowledge of multiplication and division and its applications which enables pupils in Years 4 and 5 to develop fluency in multiplication and division facts, and a confidence and flexibility with number that exemplifies good number sense. The approach also allows our teachers to critically reflect on the children's learning journey. Year 4&5 deliver four 15 minute mastering number sessions every week.

10. Mathematics Curriculum Planning

Mathematics is a core subject in the National Curriculum, and we use the Mathematics Programmes of Study from the DfE: Key stages 1 and 2 (dated September 2013) as the basis for our school curriculum, ensuring we teach the relevant statutory content. We refer to the Maths No Problem which place number as a priority and a large proportion of time is spent reinforcing number to build competency. This ensures teachers stay in the required key stage and support the ideal of depth before breadth. These resources also provide plenty of time to build reasoning and problem solving elements into the curriculum. Other resources such as Nrich and NCETM are used to supplement the teaching. The school's Calculation Policy details the approach and learning progression in the main operations of addition, subtraction, multiplication and division, and also includes examples of how to use the policies through representations.

We carry out the curriculum planning in mathematics in three phases. Long-term which is a yearly overview, medium-term which is term-by-term objectives and short-term which is daily lesson plans. Our long-term plans provide an overview to ensure the appropriate content is covered in each year group. Our medium-term mathematics plans give details of the main teaching objectives for that theme or topic and provide the structure of the 'mastery' approach to our curriculum design and organisation. This means that areas of Maths will be taught in longer 'blocks'. For Number, Addition and Subtraction, Multiplication and Division and Fractions these blocks will be taught in a progressive manner across the year. Blocks relating to other areas of Maths may only be taught once and not re-visited until the following year.

The short-term plans contain the specific learning objectives and expected outcomes for each lesson, and give details of how the lessons are to be taught. The subject leader and class teacher often discuss them on an informal basis as part of the subject leader's monitoring, as well as when more formal monitoring takes place.

Coherent Journey

When planning (Long-term and Medium term) it is important that a coherent learning journey is planned. Coherence is a comprehensive, detailed conceptual journey through the mathematics with a focus on mathematical relationships and making connections. Very often learning objectives have encapsulated several new conceptual ideas in one lesson. A mastery approach selects just one key idea and explores it in depth (small steps to success). When planning for a particular area of maths, you must consider the following:

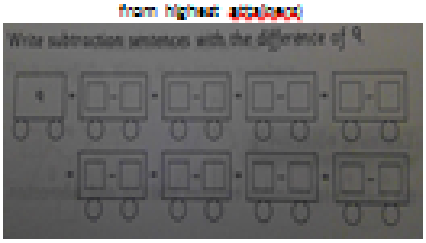
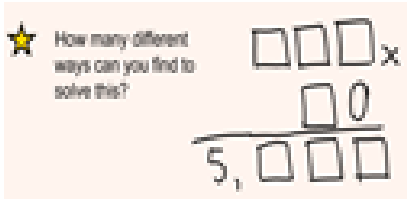
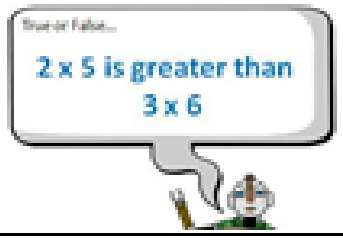
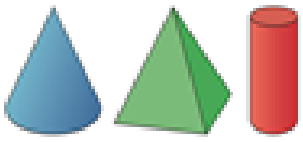
- What would have come before (prior learning)? Is this a sensible starting point?
- What will the difficult points be? How will you plan for them?
- What will come after?

When short-term planning, the learning objective and success criteria must be broken down into small steps to ensure a coherent learning journey.
All planning must take into account the following: key concepts, learning objective, success criteria, Task/s, Challenge for All, Deeper Challenge, variation, questioning, equipment and misconceptions that could arise.

Lesson Structure
Pupils are taught through whole-class interactive teaching (Ping-Pong), where the focus is on all pupils working together on the same lesson content at the same time, as happens in Shanghai and several other regions that teach maths successfully. This ensures that all can master concepts before moving to the next part of the curriculum sequence, allowing no pupil to be left behind.
The structure of a maths lesson at Mountbatten must follow the following sequence:

- **Explore**- All lessons must begin with a problem to engage and immerse children in the concept, allowing them to explore for themselves. (This must be stuck in each lesson whether created by yourself or from an SLT approved textbook)
- **Mastery**- This part of the lesson is where, as a class, you discuss and model a variety of strategies to solve the problem.
- **Guided Practice-** Once the key concepts of the lesson have been discussed and modelled, the children will apply their knowledge gained from the earlier parts of the session. This must be taught in a 'ping-pong' style which will allow you to use assessment for learning in order to identify children who will need support within the lesson. (It is not always necessary to stick this in. Instead, a sub-heading can be written and children can respond from hand-outs or from the IWB)
- **Independent Practice**- Children will independently apply their knowledge. This is also known as **'Expectation for All'**. Children who have been identified in Guided Practice as needing support will be taught in a guided group. The expectation of the guided group is that they will have access to teacher re-modelling and scaffolded tasks etc. This must be transient; once the children have showed independent security they can then return to join their peers and work independently.
- **Challenge for All**- If children have displayed a security towards the learning objective in the lesson, they must have access to a challenge which requires them to apply the concept in a more complex way.
- **Deeper Challenge-** Children who have displayed a depth of understanding within the lesson, and have completed the Challenge for All should be further challenged to a greater depth.

Deeper Challenge Ideas
Differentiation

Many different ways (Where relevant, would expect systematic working from highest products) 	**Generalising**  Captain Conjecture says, 'I can double any number, but I can only halve some numbers.' Do you agree? Explain your reasoning.	**Equivalent or not** 1 + 4 + 6 ☐ 3 + 4 + 6 3 + 7 + 5 ☐ 3 + 7 + 9 9 + 4 + 1 ☐ 1 + 4 + 9
Empty box problems 	**No clear signpost** Mark another fraction on this line. And another, and another. 	**Explain ideas / misconceptions** 
True or false 	**What is the same, what is different** Write $\frac{17}{4}$ as a mixed number Calculate 17 ÷ 4 What is the same, what is different?	**Write a top tip** *Write a top tip for children who are learning to multiply fractions.* *Can you use pictorial representations to help you explain?*
Odd one out  Which could be the odd one out and why? Could each one be the odd one out?	**Spot the mistake** 3,6,8,9 What is wrong with this sequence of numbers?	**Possible answers** A number rounded to the nearest ten is 540. What is the smallest possible number it could be?
What do you notice? Round 296 to the nearest 10. Round it to the nearest 100. What do you notice? Can you suggest other numbers like this?	**What comes next?** 936-10= 926 926 -10 = 916 916- 10= 906 **Continue the pattern** 90 = 100 – 10 80 = 100 – 20 Can you make up a similar pattern starting with the numbers 74, 26 and 100?	**Do, then explain** 37 13 73 33 3 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers.
Convince me In my head I have two odd numbers with a difference of 2. What could they be? Convince me	**Always, sometimes, never** Is it always sometimes or never true that the difference between two odd numbers is odd.	**Which is correct?** Which of these number sentences is correct? 3 + 6 x 2 =15 6 x 3 – 7 x 4 = 92 8 x 20 ÷ 4 x 3 = 37

The National Curriculum programmes of study state: … the expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. The National Curriculum also suggests that pupils should be moved on only when they are conceptually ready and that pupils who have grasped concepts will be given 'rich and sophisticated problems before any acceleration through new content.' Adaptation is not through subject content but through urgent intervention for those children who are not meeting objectives and, for those who have rapidly grasped the concept, enrichment rather than acceleration.
At Mountbatten adaptative teaching should include: skilful questioning within lessons to promote conceptual understanding; identifying and rapidly acting on misconceptions which arise through live marking and 'trigger interventions'; challenging, through rich and sophisticated problems, those pupils who grasp concepts rapidly, before any acceleration through new content; and use of concrete, pictorial and abstract representations sometimes linked to levels of conceptual development.
In regards to adaptive teaching (including SEND pupils), children will be provided with adapted provision dependent on their success within the lesson, not a preconceived judgement. Within a lesson, as outlined in Lesson Structure, there is an expectation for all. If children have been identified as struggling through assessment for learning, they must always have access to a scaffolded task or the opportunity to work in a teacher-led guided group. Children who demonstrate security towards the learning objective within the lesson must have access to a Challenge for All. Children who have displayed a depth of understanding within the lesson, and have completed the Challenge for All, should be further challenged to a greater depth (Deeper Challenge).

Special Needs Provision
At our school we teach mathematics to all children, whatever their ability and individual needs. Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our mathematics teaching we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of disadvantaged and vulnerable children, including those pupils who generate Pupil Premium, those with special educational needs, those with disabilities, and those learning English as an additional language. We take all reasonable steps to achieve this.
When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors such as classroom organisation, teaching materials, teaching style, and adaptation so that we can take some additional or different action to enable the child to learn more effectively. Ongoing assessment for learning and summative assessment allows us to consider each child's attainment and progress against expectations. This ensures that our teaching is matched to the child's needs.
With children with significant need, creation of an Individual Education Plan (IEP) for children with special educational needs.

Early Years Foundation Stage
We teach mathematics in our Foundation Stage where we relate the mathematical aspects of the children's work to the objectives set out in the Early Learning Goals, which underpin the curriculum planning for children during the Early Years Foundation Stage. The Foundation Stage, in line with the whole school, access Maths No Problem. We give all the children ample opportunity to develop their understanding of number, measurement, pattern, shape and space, through varied

activities that allow them to enjoy, explore, practise and talk confidently about mathematics.

11. Marking and Feedback

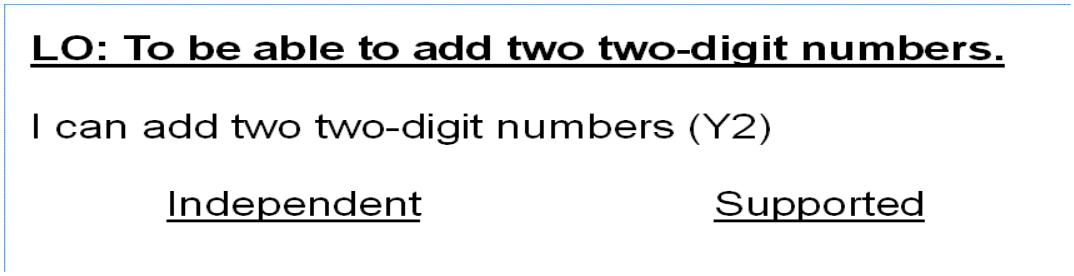
Feedback is information given to the learner and/or the teacher about the learner's performance relative to learning goals. It should aim towards (and be capable of producing) improvement in students' learning. Feedback redirects or refocuses either the teacher's or the learner's actions to achieve a goal, by aligning effort and activity with an outcome. It can be about the learning activity itself, about the process of activity, about the student's management of their learning or self-regulation
Marking is the process whereby a teacher looks at pupils' written work, examines it for errors, misconceptions and/or conceptual and procedural fluency, and then responds in some way, either in writing, speech or action. The most effective and beneficial forms of assessment are ones which support learning (i.e. are formative) and are built-in to lessons through live marking. Teachers and TA's must mark with in the lesson to give instant feedback. At Mountbatten we must provide regular opportunities for discussion of answers and strategies to support pupils' reasoning skills and check and deepen their understanding; and also interaction and dialogue (between teacher and pupils, and between pupils themselves), focusing in particular on key ideas and concepts (including misconceptions and difficult points) and effective, efficient strategies of working mathematically.
It is important for teachers to distinguish between a pupil's error and a misconception that reflects a lack of understanding: For errors, it is often enough to simply indicate where each slip occurs, to encourage pupils to correct them; If misconceptions demonstrate lack of understanding, you need to take alternative courses of action. For instance, with a small number of pupils, you may arrange **trigger intervention in the afternoon** while for a large number of pupils; the errors will be addressed in the next lesson. Pupils must be given opportunities to mark their own work. Part of this responsibility is to identify for themselves the facts, strategies and concepts they know well and those which they find harder and need to continue to work on. Where distance marking has been used, children must respond to marking and corrections during registration, before Mathletics.
As children progress through the school, they should become increasingly responsible for their learning. Helping them to act effectively on feedback provided on their work is part of the teacher's role. Unless some time is set aside for pupils to consider written comments it is unlikely that you will be maximising the impact of the marking that you may have completed out of class time. The impact of successful feedback is likely to be reflected in students' sustained improvement in mathematical reasoning and understanding, and evident in the quality of their work.

12. Marking Code:

- Green highlighter to indicate examples of how the child has met the learning objective within the lesson
- A dot to indicate where a child has made an error
- Orange highlighter followed by a written comment or a modelled explanation to address misconception or a lack of understanding
- Pupils should address any ways forward in blue pen
- Incorrect answers will be marked with a dot.
- Responding to marking and corrections should be carried out during registration, before Mathletics (or within the lesson) using a Blue Pen. The process of correcting work is encouraged to establish the importance of self-checking work by the child and to avoid making similar errors in the future.
- If a child has been identified through assessment for learning within the lesson and has worked in a guided group, you must circle supported on the learning objective label
- Intervention should be written in books if the child has had a trigger intervention outside of the lesson

13. Presentation of Maths Work

In Maths books, children must use pencil only for calculations and mathematical drawings. Rulers must be used when constructing mathematical drawings. Children must also be taught 1-digit 1-box. When using a decimal point, it must be placed on the line between the square not in its own box. Presentation in maths books must mirror that of Writing books.
In **KS1** the short date, area of maths, learning objective, success criteria and whether it is supported or independent must be put onto a sticky label and placed in the top left corner of the maths book. In Year 2, it is an expectation that they begin to write the date for themselves above the sticky label in the top left corner of the maths book, accurately underlined with a ruler.
In **KS2** the area of maths, the learning objective and whether it is supported or independent must be put onto a sticky label and placed in the top left corner of the maths book. It is an expectation that all children write the short date for themselves above the sticky label in the top left corner of the maths book, accurately underlined with a ruler.



Task sheets are permitted from SLT approved text books or mastery resources provided by the mathematics coordinator. However, they are not to be used from well-known online websites which put little thought into deepening the understanding of mathematical concepts. When task sheets are used they must be reduced, unless scale is important, and trimmed or cropped to neatly fit in maths books. Unnecessary

information such as task sheet titles and page numbers etc. must be removed. It is encouraged for staff to create their own task sheets, taking inspiration from the aforementioned resources. Not all resources found will be appropriate for our children; therefore it is important to adapt them to enable access for all learners. It must also be taken into account, when crafting tasks for children, the reading ability. No child should be unable to access the mathematics due to reading ability. Challenges must be obvious and stand out so that it clear where children ae being challenged. The following format must be used for **all** challenges (you can still use the challenge documents previously stated through this format- this can be copied and pasted into this format and can include any pictures and diagrams etc.):

Challenge for All

1) **Six children have taken a mental maths test. The mean score was 15 out of 20.**

Can you find the missing score in the list of scores below?

18 16 17 13 12

2) **Sam uses a calculator to find the mean of 9, 7, 5, 9 and 13.**

He writes the answer 42.

Is Sam correct?

If not, can you work out where he has gone wrong?

Deeper Challenge

Three school teams are taking part in the heats of a 4 × 100 m relay race cross-schools competition on Sports Day. If the mean average time of the four runners in a team is less than 30 seconds, the team will be selected for the finals.

At the start of the last leg of the relay race, the times (in seconds) of each teams' first three runners are:

Team Mountbatten: 27, 29, 31
Team Archie: 45, 43, 37
Team Marvell: 29, 30, 25

Which of the teams have the best chance of being selected?

Explain your reasoning.

14. Assessment

Assessment for Learning

Assessment for learning is embedded into each lesson (Live marking and trigger interventions) and teachers use assessment for learning techniques and strategies on a daily basis in order to identify pupils' strengths and difficulties, inform the next steps for each child's learning and improve the learning outcomes for each child. Short–term planning is constantly reviewed and modified on the basis of these assessments. Children have targets in the front of their books which must be updated at the end of each area of maths taught to identify gaps in the child's knowledge.

Summative Assessment

We make termly summative judgements of each child's achievement against the objectives taught that term. We use end of term assessments (Maths No Problem standardised assessments) to measure progress. It is an expectation that a question-level analysis will be carried out and reported to the mathematics coordinator. This QLA must be used a teaching tool to close the gaps.

Some of the evidence base for these assessments may also come from day-to-day class work, but there is an emphasis on evidence that comes from specific tasks and tests used to assess the degree of retention, independence and breadth of application shown. We use these judgements to assess progress and achievement against individual, school and national targets. We identify and target those children not making expected progress and intervene accordingly.

Assessment is tracked termly on Insight, which tracks whether a each child is on track for their target in each subject. Children who haven't made progress are put on an Intervention list and these children are a focus in teacher's future planning. We pass all assessment and tracking information on to the next teacher at the end of the year, so that s/he can plan for the new school year.

Teachers in Year 2 will also use non-statutory End of Key Stage National Curriculum tasks and tests as one part of the assessment picture for each child and teachers in Year 6 will also use statutory End of Key Stage National Curriculum Tests. Year 4 also regularly practice for the MTC.

15. Learning Environment

The learning environment should be a combination of both reference and working walls. All display should be planned with what impact it has on the children in mind. Maths working walls must consist of the following:

- Up to date for the current area of Maths
- Example of pupil's work from the current area of learning
- WAGOLLs and Conclusions for the current area of learning

- Evidence of children reasoning and problem solving on display
- Teacher modelled WAGOLLs of reasoning

Reference displays must consist of the following:

- Prompts to support learning appropriate to the end of year objectives for year group
- Focus times tables on display for year group
- Number lines appropriate to year group
-

Teacher Research Groups (TRGs)

It is an expectation that as a staff we carry out regular TRGs. A Teacher Research Group is where as a group, we observe each other teach. First the lead teacher will explain the aims of the lesson and how they are going to facilitate the learning through the mastery approach through the 5 big ideas: Representation and structure, mathematical thinking, variation, fluency and the coherence of the lesson. The staff will then watch the lesson and will make notes on those aspects of the lesson and focussing on the post lesson discussion questions.

These are some of the initial common characteristics of these lesson-based meetings:

• The teacher prepares some contextualising remarks about the class, common systems and policies employed in the school, so that all discussions after the lesson can focus on the mathematics, the approaches used and the learning that ensues.

•Before the lesson, the teacher outlines her/his aims, including the key point, key difficulty points, and any features which s/he might welcome feedback about. A focus of attention might, for example, be use of representations or application of variation theory.

• Each member of the TRG, in turn, mentions briefly one aspect of the lesson which they identified as significant for them (trying to avoid making judgements by using 'I liked' phrases), and explains why it was significant).

• Participants are invited to think about the 'journey' through the lesson: how did it begin, what followed, where did it end? A focus on describing the logical, coherent conceptual journey is encouraged.

• More in-depth discussion on particular features which the teacher had planned for and/or that the participants noticed is prompted, possibly by the opening remarks from each participant, the teacher's planning and/or opening remarks or a pre-prepared sheet which outlines key features.

• Meeting finished with each participant invited to talk about at least one thing that, as a result of this meeting, they will try out in their practice.

The role of the Subject Leader

The Mathematics Leader will:

- Provide a strategic lead and direction for Mathematics in the school;
- Provide support and advice to staff in the delivery of the Mathematics programme of study;
- Remain informed about current developments in the subject by attending INSET sessions and being involved in independent research and reading;
- Disseminate relevant information to staff;
- Deliver INSET sessions to staff, to support staff development;
- Monitor and evaluate teaching and learning of Maths;

- Monitor standards in the subject, through planning and work scrutiny, statistics, quality of teaching and pupil assessments;
- Order and maintain resources to enhance effectiveness of Maths teaching within the school;
- Consider with staff and work with SLT members in the evaluation and planning of actions included within the School Development Plan.

The Class teacher will:

- Be responsible for the teaching of Maths as set out in the policy.
- Provide planning and reviews for the Head Teacher and Maths leader to have access to.
- Provide samples of maths work to the Maths leader when required.
- Assess children's work in order to detail future planning.
-

The Head teacher will:

- Provide support by encouraging staff and praising good practice.
- Monitor learning and teaching through lesson observations.
- Monitor planning and reviews.
- Give feedback to teachers following lesson observations.
- Support staff development through in service training and provision of resources.

Home/school links

We aim to raise the profile and understanding of our approach to Maths with parents, and they are encouraged to be actively involved in supporting children's learning in school in a number of ways. Maths Days are organised with relation to the curriculum, assessment and supporting children's mathematical learning.
Homework will be sent home regularly as appropriate in order to reinforce concepts and skills being learned in school. (See Homework Policy).