Dunmow St. Mary's Primary School

Policy for Mathematics

'Mathematics, rightly viewed, possesses not only truth, but supreme beauty'.
Bertrand Russell

Date written	February 2021
Written by	Lois Rooney (maths coordinator)
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Policy development

Our policy was developed during the Spring term 2021 following a year of staff meetings, training sessions and discussions surrounding 'maths mastery' at Dunmow St. Mary's and reviewing how maths looks in our school. The maths coordinator (KS2 teacher) and a member of KS1 teaching staff took part in a years' mastery training with the Maths Hub and other schools in the area. Subsequently, all teaching staff attended staff meetings discussing the 5 Big Ideas of Mastery, Speedy Maths and Mastery vs. Greater Depth. Outcomes and key points from these meetings fed into the reshaping of our maths policy, as well as consultations with the EYFS lead.

Contents

Part 1: Intent

Why do we teach mathematics?

'...to help children make sense of what they see around them and to give them the skills they will need in their life.'
'...to teach children to develop logical thought, provide the groundwork for number skills that will be useful throughout life and the develop a joy of Maths in the children'
'...to enable children to apply number knowledge to everyday tasks so that they can function in a world that requires infinite mathematical applications.'

Contributions from staff 2021

At Dunmow St Mary's we recognise that maths is an integral part of everyday life and children need key maths skills to become independent, successful members of society. We want children to understand that maths will be useful to them in any career that they aspire to. From the beginning of their school journey, children have the opportunity to play, experiment, discover and investigate mathematical concepts in a nurturing and supportive environment that celebrates mistakes as opportunities for learning. This enables our children to build their resilience to face mathematical problems now and later in life.

We expect that children will leave the school with confidence in their own ability, with the skills to extend and apply their knowledge and the belief that mathematics is enjoyable and rewarding.

We are passionate about building children's individuality by inspiring them to apply their maths skills creatively and by focusing on building positive perceptions of mathematics.

Through teaching mathematics, we endeavour to help every child feel:

- Excited about making new discoveries
- Curious about solving puzzling problems
- Prepared to tackle challenges with strategies they are confident in
- Determined to overcome difficulties
- Supported and comforted so that maths anxieties are not a barrier to exploration and learning

- Challenged
- Proud of mastering new skills
- Willing to take risks and make mistakes
- Confident in explaining their thought processes
- Intrigued and inspired by making connections between areas of maths and recognising their use in the wider world
- That they can be expressive and creative in the way they respond to mathematical problems

Part 2: Implementation

How do we teach mathematics?

'...by showing children maths relation to real life problems through showing, modelling, discussing, exploring and practising.'
'...by exploring areas of maths using real objects, visuals, words and symbols, playing games interactively, using repetitive practice for developing fluency, engaging with reasoning and problem solving discussions, linking maths to our creative curriculum and other subject areas.'
'....with hands on equipment, modelling, repetition, paired work, group work, computing facilities and problem solving challenges.'
'...by making maths meaningful, putting it in context to enable learning and application.'
'...by taking learning out of the classroom and applying maths to the world.'

Contributions from staff 2021

We know that children learn best when they are active learners and this is as true in maths as in any other subject. We value and teach the core skills to produce efficient mathematicians. For each new concept taught we start with using resources to build understanding, then move to visual and pictorial representation and finally onto abstract form. We teach our children to use trial and error when faced with a problem, to work systematically and methodically and to choose efficient methods of calculation. We want the children to understand that the answer is only the beginning: maths isn't just about getting the answer, it is about all the other things you can discover on the journey. Children are encouraged to make connections and use knowledge from other areas of maths to support new learning, to explain their thought processes and understanding and to justify their decisions on how they reached an answer.

We empower children to become curious and excited about making new discoveries and solving problems. They will be prepared to tackle challenges and to take risks, determined to overcome difficulties and recognise that they can be expressive and creative in their responses.

Timetabling

All KS1 and KS2 pupils receive mathematics in a daily lesson lasting between 45 and 60 minutes. In some instances, additional provision is made for individual or small group interventions to help fill gaps and keep the children moving at the same pace as the whole class.

Years 1-6 also complete 10 minutes of ‘Speedy maths’ a day in addition to their maths lesson. Years 3 and 4 also do 5-10 minutes of ‘Time 4 Tables’ each day to ensure that they are secure with multiplication and division fact recall before moving into Year 5.

EYFS

In the Early Years, a play based curriculum allows adults to embed maths into everything they and the children do: in routines, in play, and in the environment, both inside and out. This allows young children to see that maths is everywhere and there is a strong emphasis on developing mathematical language. Adults regularly discuss with children what they notice and help them to solve real life problems they may face.

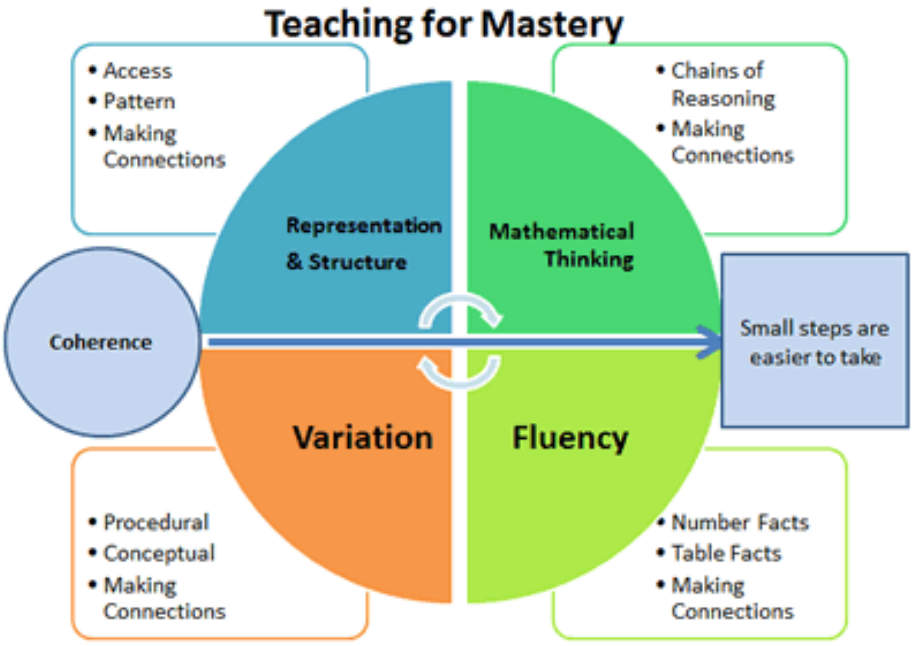
In addition to this, teachers introduce certain mathematical concepts during daily, whole-class sessions lasting 20-30 minutes. These sessions are focused on the skills of labelling, measuring and ordering, thus helping children to understand how numbers can be used and represented in different ways. The sessions can include a mix of discussion and activity.

Part 2a

Mastery statement

At Dunmow St. Mary's, we have adopted a maths mastery approach to the teaching of mathematics. This approach is rooted in a strong belief that all children, given sufficient time and appropriate resources, will succeed in mastering maths.

5 Big Ideas of Mastery



Source: NCETM

The 5 Big Ideas of Mastery are the fundamentals that underpin every maths unit and lesson.

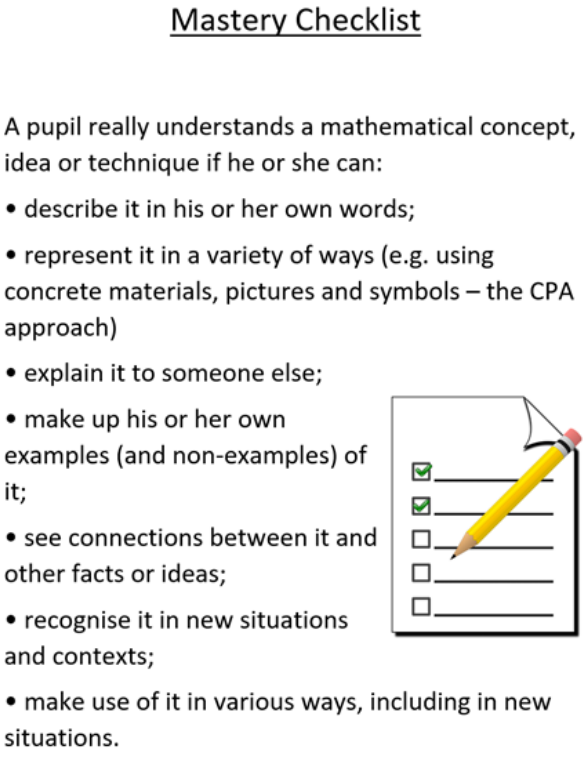
- *Fluency*: a lesson may be teaching number facts or methods. For example, Speedy maths addresses repeated rehearsal. Also, discussions in lessons help children to make connections between their maths.
- *Variation:* children are presented with examples that differ in both the procedure and the concept. Children are shown 'non-examples' and asked to consider why that doesn't fit the mould.

- *Representation and structure:* children develop their ability to represent their thinking using patterns, drawings or bar modelling. They think about how these representations may change when the structure of the question or task differs.
- *Mathematical thinking:* children are asked to explain how they reached an answer rather than just accepting an answer at face value. They consider others' answers and unpick mathematical processes to prove their answers.
- *Coherence:* this could be coherence across a unit, making sure the coverage is progressive and builds upon previous skills, or coherence within a lesson ensuring that small steps are taken to build up the learning

In all of these areas, children are consistently making connections: between their own answers, between others' answers, between different areas of maths, between real life and lessons, and between different subjects and maths.

Mastery checklist

A 'mastery checklist' is used as a reference point for teachers to ensure that they plan opportunities for children to demonstrate that they have mastered an area of maths:



Source: checklist from NCETM Mastery Assessment materials.
Poster by Nicki Thapa, DSM.

Whole-class teaching

A key principle of maths mastery is that the class are working together on the same unit thus in Years 1-4, maths lessons are taught whole class with the teacher and the support of a TA. In Years 5 and 6, children who are working below age related expectations are taught in a smaller group with a specialist maths teacher and a TA whilst the other children stay with their own classes for maths. All children receive the same curriculum coverage but those with the specialist maths teacher will benefit from smaller group sizes, being able to go at their own pace and more time spent with support from an adult. Children move between the smaller and main groups regularly as teachers reflect on assessments and how children progress within different units; these groups are flexible and continuously being reviewed.

Deeper not further

In maths mastery, challenge is provided by going deeper rather than moving on to different content or bigger numbers. We use 'dive deeper' resources that encourage children to deepen and show their level of understanding in a number of different ways: drawing it, explaining it, making intentional mistakes, telling maths stories and proving/disproving statements.

Children working at greater depth.

There are some children whose mathematical understanding and application goes beyond that expected from the mastery checklist for their age related expectations. These children, who are working at greater depth, are expected to:

- Solve problems of greater complexity where the approach is not immediately obvious
- Demonstrate creativity and imagination in their reasoning and problem solving
- Independently explore and investigate mathematical contexts and structures
- Communicate their results clearly and systematically explain their mathematics
- Take ownership of their own mathematical investigations / pose their own research questions

A key indicator as to whether or not a child is working at greater depth will be their levels of confidence and independence.

Support for children

The NCETM documents refer to advice that children who struggled mathematically are supported by teachers: "Long term gaps in learning are prevented through speedy teacher intervention." Therefore, we place an emphasis on immediate or same-day intervention (where timetabling allows).

Teachers or TAs may deliver pre-teach sessions, gap filling sessions or overlearning sessions to ensure that no child is left behind. Where children have an EHCP or an SEN One Plan, they may

have work differentiated appropriately to meet their individual needs. In EYFS, teachers identify different focus children each week and spend time working with these children and assessing their progress closely. Mid-way through the year, EYFS teacher may begin to identify children who would benefit from support sessions or monitoring during continuous provisions to ensure maths is being practiced and made relevant to the children.

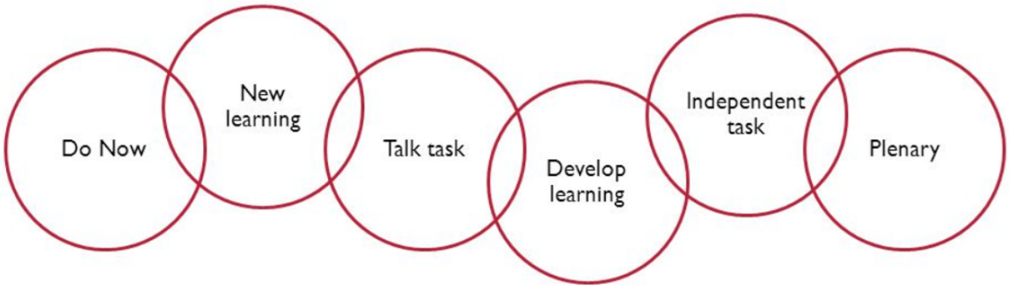
We have found that there is not a 'one size fits all' for maths intervention schemes. Instead, teachers have the flexibility to select appropriate styles of interventions depending on the needs of individual children. The SENCos offer support and guidance in selecting appropriate schemes or teachers can use curriculum statements and key performance indicators to tailor intervention sessions accordingly.

Adaptive teaching

The mastery approach champions adaptive teaching as opposed to differentiating many different ways. Our staff are skilled in responding to answers, questions and discoveries in the moment and using those to enforce, revisit or challenge teaching points. Being adaptive to what is happening in the classroom and reshaping lessons to ensure maximum pupil progress is a more effective approach than differentiating work and it then not having the desired impact. Adaptive teaching can be used both to recognise what is needed to support children who are struggling to grasp a concept as well as identifying children who have mastered the concept and need challenging through deeper questioning or investigation.

Lesson structure

Maths mastery recognises that there are 6 key elements to a lesson. Our teachers use these elements but are flexible and creative with the order, duration and deliverance of each element.



Source: Mastery in Primary Mathematics, Tom Gary.

CPA - Concrete, Pictorial, Abstract

Maths mastery champions the development of understanding through using concrete, pictorial and abstract representations. This is not age, ability or unit specific: concrete resources are used

to expose the key structure of maths concepts which is then transferred into a pictorial representation before being able to show understanding in the abstract form using digits and symbols. Teachers in all year groups use concrete resources to introduce concepts and may spend whole lessons focused solely on deepening children's understanding through the use of effective questioning and manipulation of the resources to address misconceptions. We are keen to ensure concrete resources and practical play is not perceived as just for children who need support. As stated on the mastery checklist, to show mastery, all children need to be able to represent their thinking which could take a concrete, pictorial or abstract form.

'Culture of error'

Our teachers promote positivity around making mistakes and using these mistakes as opportunities for learning. To do this, children are shown examples with errors and then asked to unpick the person's thinking, spot where and why they made a mistake and then offer up advice to solve the problem. Children reflect on questions they got wrong and do not move on with their learning until they have unpicked their own thinking either independently or with the help of a peer or adult. As children become familiar with this routine, they are able to identify if they have made a calculation error, misread the question or have a deeper conceptual misunderstanding. We aim to reduce children's anxiety surrounding making mistakes and provide them with self-belief that they can use mistakes as learning opportunities to overcome hurdles.

Part 2b

Curriculum

We follow the 2014 National Curriculum for maths and staff use the White Rose yearly overviews to structure the order they teach each maths units, though staff are encouraged to be flexible with this; the length and order of blocks may be altered if the teacher feels that is most appropriate for the needs of their class. The White Rose overview is used as a medium term plan and teachers then break this down into lessons on their weekly planning proforma.

As stated in the 2014 National Curriculum, the aims of maths are to ensure that all pupils:

• become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately

• **reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

• can **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.' (National curriculum page 3)

Fluency

How do we ensure children become fluent at Dunmow St. Mary's?

Fluency is not just about remembering facts and being able to answer the same question with different numbers. It is about being able to calculate using efficient methods, recognise questions where there is varied fluency and conceptual and procedural variation, as well as being able to manipulate questions by using connections and relationships to work towards a solution. Some lessons may be focused on ensuring fluency skills are secure for every pupil in a variety of ways, known as 'varied fluency', so that they are equipped and confident in tackling problems.

Speedy maths

In Years 1-6, children complete 10 minutes of 'Speedy maths' at least 4 times a week.

The purpose of Speedy maths is two fold: for children to practice fluency skills for the content they are learning that week so that they are efficient and confident when calculating and also to recap and revisit learning from previous units so that this is not forgotten. Speedy maths questions are designed to achieve both of these objectives as well as ensure sufficient varied fluency with questions displaying the 'unknown' part in different places and with the equals sign not always at the end. Teachers also draw children's attention to the importance of reading the question and looking carefully at the numbers as making connections and links with other questions/knowledge may help them reach an answer quicker.

Based on the end of key stage expectations with regards to how much time is given per question on the arithmetic paper, there is variation in both the number of questions and length of time given to complete the questions in each year group:

Year	Questions	Time
1	10 (shown on IWB at the beginning of the year, pupils write responses on mini white boards, after Easter use paper copies)	10 mins
2	10	7
3 - 4	12	7
5-6	12	5

Speedy maths is not differentiated unless a child's One Plan or EHCP suggests it more appropriate for them to practice number skills from a different year group. Staff have received training and support documents outlining how to offer support and extension for children during Speedy maths sessions.

Children track their scores during the week in order that they can celebrate their progression, identify any recurring gaps and ask for support, and look back at the previous day's questions to make connections and improvements with their learning. It is important that the children understand they are not competing against each other but are competing against their score from the day before and striving to be reflective and resilient in improving their score.

To ensure appropriate progression between and within year groups, our calculation policy highlights how both written and mental strategies are taught and built upon as children move up through the school.

By rehearsing fluency skills during Speedy maths, more lesson time can be dedicated to developing reasoning and problem solving skills. To assist children in becoming fluent, we subscribe to Times Tables Rockstars and Numbots as well as Mathletics (in Year 6). Numbots is introduced to children towards the end of EYFS in preparation for Year 1, and Times Tables Rockstars is introduced to children after their multiplication unit in Year 2. In addition to this, the primary focus of our homework is to consolidate and practice fluency skills so that children are equipped and confident ready to apply these in lessons (see homework policy).

Time 4 Tables

In Years 3 and 4, there is a big focus on ensuring that all children are fluent recalling multiplication and division facts up to 12 x 12. To support children developing automaticity with this, each day the children take part in 5-10 minute sessions called 'Time 4 Tables'. These sessions focus on learning times tables in a variety of ways: using skip counting, number lines and counting sticks; using concrete materials to represent times tables; chanting and rehearsing times tables facts; playing engaging games and more formal questions to assess progress in the children's learning.

Reasoning

How do we ensure children are able to reason mathematically at Dunmow St. Mary's?

Children are consistently asked to 'prove it' or 'convince me' when giving answers or coming to conclusions as well as always being asked 'why' and 'how do you know' so that they know that providing an answer is only just the beginning of their understanding. They are encouraged to respond in full sentences using accurate mathematical vocabulary. To support their development with this, 'reasoning tree' posters are used on learning walls, sentence stems are modelled and made high profile, and key vocabulary is made visible and regularly referred to. Lessons may include the use of 'sentence stems' which are repeated and rehearsed to embed key facts. Many reasoning tasks are sourced from Gareth Metcalfe's 'I see reasoning' booklets as well as White Rose Maths and the 'which one doesn't belong' website. Diagnostic questions are also used to generate deep discussions: this is where four plausible options are given and children must explain how each of the possible answers were reached, what misconceptions people may have made and why only one of them is mathematically accurate.

Mathematical talk is a key part of every maths lesson. Children are given opportunities to discuss and debate possible answers, justify and convince their peers of their solution, and explore different possible outcomes. Concept cartoons are used to facilitate these discussions as they enable children to consider other people's perspectives as well as putting forward and justifying their own.

The acronym 'DEER' is used to support children's verbal and written responses:

D – decide your answer to the question
E – explain why that is the answer
E - evidence - provide evidence (often the form of a calculation or a bar model)
R – review the question by reinforcing why your answer is correct.
(S – suggest what mistake the other person has made to get the other optional answers)

The 's' is an additional element for children working at greater depth though should be attempted as often as possible by all children.

High standards of English grammar are expected in written and verbal responses though teachers may mark a 'V' where a verbal response is given and writing would have been a barrier to learning (this is particularly common in KS1).

Problem solving
How do we ensure children are able to solve problems at Dunmow St. Mary's?

Problem solving is not just a case of putting fluency skills into worded problems (maths stories). Although multi-step word problems are used to help develop children's comprehension of concept, real life application and ability to unpick what a problem is asking them, we believe problem solving skills go much deeper than this.

Problem solving skills include:

- Working systematically rather than picking random numbers
- Looking for and continuing patterns
- Using trial and error/improvement to reach conclusions
- Searching for all eventualities
- Presenting multiple solutions
- Being able to represent solutions in many different ways
- Combining information to help towards a goal

Examples of problem solving tasks are sourced from a wide variety of resource banks: White Rose maths, NCETM, Nrich, Testbase, Power maths text books, 'Which one doesn't belong' website.

Children are often asked to design their own puzzle with a few statements that they must apply to their design. Here children are applying their knowledge whilst deepening it by trying to think about how they can create a challenging but not impossible problem and carefully selecting what information to give to the solver and what to withhold. Children particularly enjoy sharing these in class plenaries or as starter activities in subsequent lessons and solving each other's puzzles. This helps to build a really positive and enjoyable culture around problem solving. Similarly, problem solving activities might be group based or a paired task which develops children's reasoning and problem solving skills such as trying different solutions, choosing between working systematically or using trial and improvement, and being able to combine information to reach a mutual goal.

Bar modelling

We are very passionate about the use of bar models across the school to support children's understanding of the structures underlying maths questions. Bar modelling begins in EYFS with the use of tens frame and progresses through the school across all areas of maths (refer to the Bar Modelling Progression guide for detailed examples of how bar models are used in each year group). The school promotes bar models through involvement in 'Barvember' every year and awarding 'Barvember champions' to children who are tackling problems with enthusiasm and creativity. Bar models are an incredibly flexible tool and we aim to equip children with the confidence and skills needed to be able to adapt bar modelling to help them understand any problem they face.

Programmes of study

In EYFS, the maths objectives children are working towards are found in the Development Matters document and encompass number and shape, space and measure. For a more detailed overview of the contents of these areas, please refer to the Development Matters document.

In Years 1 -6, as stated in the national curriculum, the following areas of maths are taught:

KS1	● Number: Number and place value ● Number: Addition and subtraction ● Number: Multiplication and division ● Number: Fractions ● Measurement

	● Geometry: properties of shapes ● Geometry: position and direction ● Statistics
KS2	● Number: Number and place value ● Number: Addition and subtraction ● Number: Multiplication and division ● Number: Fractions (including decimals and percentages) ● Measurement ● Geometry: properties of shapes ● Geometry: position and direction ● Statistics ● Ratio (Year 6) ● Proportion (Year 6) ● Algebra (Year 6)

For a more detailed overview of the content for each unit, please refer to the 2014 National Curriculum.

Homework

Children in Years 1 -6 are set a weekly maths activity that comprises a series of fluency questions rehearsing key skills to consolidate their learning from school and ensure that their arithmetic skills are kept sharp. A set of 15 statements for each year group have been selected as fundamental fluency skills (see homework policy) and children will revisit these several times throughout the year in their homework tasks.

Maths and our creative curriculum

Although much of our maths is taught discretely we make links to our curriculum themes wherever possible. We regularly have had whole school maths days or even a maths week. For example, a day where every year group explored mazes. We take advantage of our grounds and our local community by exploring maths outdoors and in real life scenarios e.g. visits to the shops to buy ingredients, then weighing those ingredients and scaling recipes up or down. Many of our enterprise topics involve statistics and questionnaires to establish people's preferences before a design is created. This involves many areas of maths whilst learning for a purpose. There are strong links between computing, science and maths thus teaching of maths may be enhanced by weaving these subjects together, particularly units such as statistics.

EYFS

At Dunmow St. Mary's, children's early experiences in maths focus heavily on practical manipulation of physical maths using our extensive collection of maths resources, outdoor space and geographical

location. The outdoor area is used for children to explore number recognition using large dice, playground markings and collecting objects for counting. The water tray is a great resource for children to investigate how much water different containers can hold which allows them to begin to compare the capacity of objects. Construction materials are used to teach children the language of 2D and 3D shapes and for them to begin comparing objects by size. Both the outside and indoor areas are used for 'shape hunts' and many objects in the small world area are used for practicing counting as well as adding and subtracting.

Children in EYFS regularly visit the local shops to purchase ingredients. They are taught to recognise the value of each coin, discuss whether they think they can afford different items and decide if they will need change. These ingredients are then used in the cookery area in school which provides opportunity for children to compare things by mass and be introduced to the vocabulary 'heavier' and 'lighter'. They may also begin to recognise that some objects are measured in litres and some in grams. During continuous provision, children can continue using their money and mass knowledge by playing shops or playing in the kitchen.

Using daily routine prompts, the children begin to be able to sequence events in the day and discuss what might be coming next and what has happened before. Daily routines are kept as similar as possible on a day-to-day basis so that children can become familiar with which events occur at what times during the day. Each part of the day is labelled, such as 'snack time' or 'home time' so that children begin to understand the idea of time relating to when something happens.

KS1

Use of concrete resources is continued in KS1 as pupils carry on using small world objects, or any objects in the classroom, to aid their understanding of number through counting but also subitising (instantly recognizing the number of objects in a small group without counting). Small word or classroom objects are also used to support understanding of addition and subtraction by physically putting items in groups and counting them, or removing items and counting how many are left. Children then begin replacing small world objects with mathematical resources like dienes, place value counters and cubes. This helps them develop their understanding of number and enables them to transfer representations from concrete to pictorial which will mean they can be more efficient mathematicians.

As children become more confident using technology, connections are made between computing and maths. Beebots are used for children to explore positional language and learn how to give directions. Children use grids or draw their own and program the Beebots to move around them. Similarly, pirate maps are also used as a stimulus for discussing position and direction.

When using the cookery area, children explore the concept of capacity in more depth by making their own 'George's marvellous medicines' and use a range of equipment to measure their ingredients such as cylinders, teaspoons and tablespoons, and pipets and plastic syringes. In addition to this, children become more familiar with reading scales for measuring out ingredients both in millilitres and in grams.

In KS1, children begin to collect their own information and data about a subject, such as a nature watch or people's 'favourite' something. They then transfer the information they have collected into a form of presentation such as a pictogram or simple bar chart. This allows the children to see that their investigation served purpose and can be used for further learning.

Lower KS2

Children become increasingly confident with using dienes, place value counters, multilink cubes and cuisenaire rods as representations for their numbers or calculations, as using physical objects such as small world people or teddies becomes difficult with larger numbers! They also continue transferring physical representations into pictorial ones, with an emphasis on bar models.

In these years, children broaden their understanding of the number system by looking at Roman numerals which coincides really well with the Romans topic; children learn how the number system we know now has developed and draw comparisons and similarities between it and Roman numerals.

Strong links between science and maths begin to be made in lower KS2 as different types of charts, tables and graphs are used for presenting results in science experiments. Children discuss similarities and differences between the different charts, decide which chart or graph would be most suitable for the results of their science experiment and also become familiar interpreting information from graphs provided by others. They develop their ability to count using different multiples, understand the importance of equal sized integers, discuss discrete and continuous data and identify the titles of x and y axes.

Cookery still plays an important role in developing mathematical skills and application of these skills. As well as learning to read scales with increasing accuracy, pupils consider the duration of cooking. They convert between minutes and hours in recipes and use their knowledge to plan how long it will take them to cook different things. They also begin to consider scaling of recipes by using fractions of amounts and their knowledge of doubling, halving and times tables.

Upper KS2

Though in their final years of primary school, children still engage in practical, real life maths to ensure they see their learning as purposeful and useful. Children learn to read scales in a wide variety of contexts such as on Newton metres when investigating pulleys and on spaceship dials.

Enterprise topics lend themselves strongly to collecting data and presenting this data using a variety of charts, including pie charts. Similarly, science investigations about plants and shadows allow for accurate recording of results and presentation using different graphs. These skills are transferred into computing where pupils present their information using Microsoft Excel. Children also look at costs in a business and discuss profit and loss with consideration of negative numbers.

Links between computing and maths continue to be enhanced through the use of Python and Scratch to create algorithms. Both pieces of software are also used to embed understanding of position and direction, inputs and outputs and number sequences.

Art and DT projects compliment children's development with space, shape and measure in a number of ways. Children become familiar with the properties of 3D shapes, the concept of volume, being able to recognise nets of 3D shapes and apply their knowledge of scaling when building models of the Taj Mahal or designing and making boxes for their chocolates. Alongside these projects, children are exposed to metric and imperial measurements, convert between them and recognise when each might be used.

Part 2c

School environment

Links with parents.
When children join the school in EYFS, parents are provided with an information pack outlining how maths is taught in the Early Years. The pack also includes useful resources like a number line and suggestions for how parents can support maths learning at home.

Parents have the opportunity to discuss their children's work formally during three parent meetings, one each term. Informally, parents can speak to teachers during drop in sessions after school or by making an appointment at any time.

Parents have been invited to attend workshops to enhance their understanding of the progression of written strategies. These links will be extended to develop understanding of maths mastery, the use of concrete, pictorial and abstract, and the use of bar modelling across the school.

Links with governors
Governors are invited to experience maths teaching in the school by being involved in lessons and also maths theme days/weeks. They are encouraged to attend subject specific staff meetings and liaise with the maths lead at governor meetings.

Staff development
The Head teacher and maths coordinator lead INSET days and staff meetings for staff as needed. Teachers are able to attend courses targeting specific areas of maths for their personal development. As a consequence of Covid-19 restrictions, more virtual staff meetings have been held. This has also led to the maths lead providing 'mini-CPD' video clips between 5 and 10 minutes giving staff a quick update/development point/discussion point to consider. These have been very well received due to being easily accessible and succinct.

Resources
As a school, we are well resourced with maths equipment to help support our CPA approach to mastery across all year groups. We believe that all children, no matter how old they are, should

have access to resources which help support them in their understanding of mathematical concepts. Similarly, one part of mastering maths refers to being able to represent their thinking which could be done using concrete or pictorial resources as well as abstract representations. Where resources are unfamiliar to children, time is taken to explore their purpose and meaning so that children can understand what they are representing and how the resource will support their learning. Once confident, children are encouraged to take ownership over selecting their support tools and will independently choose which resources they think will be useful to them.

All classrooms are equipped with age-appropriate concrete resources as well as there being a central area with a vast range of additional resources.

Part 3: Impact

How do we assess the impact of maths teaching in our school?

Assessment

Within and between lessons, teachers use questioning, children's work, observations and verbal discussions to assess the progress and needs of children and then reflect and adjust their lessons accordingly.

For information regarding teacher assessment in lessons, self-marking procedures and summative assessments, refer to the school's assessment policy.

Subject monitoring

We use a variety of methods to monitor the impact of maths learning and teaching in our school so that we can monitor, evaluate and review effectively.
Monitoring may take one of the following forms:

- Lesson observations and learning walks: these are planned and staff are made aware of a clear focus and feedback is given both individually and whole-school to inform future developments
- Book looks: a selection of books are reviewed with a particular focus. The selection of books may be random or specifically chosen
- Monitoring planning/provision: access to shared planning on the google drive allows for staff to have a good understanding of what is being taught in other year groups as well as allowing for the leadership team to monitor the provision, activities and key teaching points planned into weekly progressions
- Pupil progress meetings: these are held between class teachers and senior leaders. The progress of each child is reviewed and discussion ensures quality first teaching is being beneficial for children. Moreover, necessary interventions or focus groups are identified and actions are noted on a cohort action plan
- Pupil perceptions: children are asked informally and formally about their perceptions of maths and how the school could enhance their learning in maths. Their views inform the planning of subject development across the school

- Governor visits/meetings: Governors make visits to the school and are involved in maths activities. They may undertake lesson observations, discussions with the subject lead, meetings with pupils and book looks
- Staff questionnaires: through the use of Google forms, views from staff are gathered regularly and form part of the consultation process before decisions and the implementation of new ideas. Similarly, staff questionnaires are used to gather feedback following trialling new ideas.