Maths and Visual Calculation Policy (VCP)

Our curriculum is carefully designed to meet the statutory requirements of the National Curriculum. As a Christian school, we believe that Christ has called us in every aspect of our working together to live out our 'Loving three' values love, joy and wisdom.

Vision

To educate and develop all children in a happy, caring community, nurtured by Christian values that place individuals at heart and allow everyone to shine.

Intent

At St Mary Magdalene we intend to:

- Ensure our children have access to a high quality maths curriculum that is both challenging, enjoyable and full of possibilities.
- Provide our children with a variety of mathematical opportunities, which will enable them to make the connections in learning needed to enjoy greater depth challenges.
- Ensure children are confident mathematicians who are not afraid to take risks.
- Fully develop independent learners with inquisitive minds who have secure mathematical foundations and an interest in future learning.
- Promote a love of maths and encourage **Mastery** at all levels of learning.

Our intent is fully in line with the National curriculum as it aims 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.

The **breadth** of our curriculum is designed with the below goals in mind:

- To enable every child to reach their full learning potential in all areas of school life by recognising and catering for their individual needs, learning style and to experience 'life in all its abundance'.

- To ensure that all children, regardless of their age, ability, gender, ethnicity, culture or special educational or physical needs, are able to learn effectively.

- To offer a provision that shows that every child matters and that they matter to God.

- To instill in children a love for learning linking to our school motto 'Love to learn, learn to love'.

- To plan a curriculum which is motivational, inspirational, **broad, balanced** excellent and enjoyable.

- To encourage all staff to employ a variety of creative, innovative and inspiring teaching strategies to make learning exciting and to guide children in their learning and lines of enquiry.

- To continually monitor, evaluate and review learning and teaching to ensure continued improvement.

- To ensure that appropriate resources are available in order for staff to deliver exciting learning opportunities including use of national, local and diocesan resources.

- To ensure that the learning environment is creative, inviting and stimulating and reflects the children's learning journey.

- To include parents/ carers in their child's learning valuing families and family life.

- To provide learning opportunities which are deep, memorable, purposeful and challenging and lead to **mastery** understanding.

- To ensure children are kept safe when engaging with the curriculum and safeguarding procedures are followed in accordance with the safeguarding policy.

Organisation

We have structured a coherently planned Maths curriculum so it is consistent throughout KS1 and KS2. Each year group has:

1. A curriculum overview which states clearly the **breadth** of what needs to be covered.

2. Mid- term planning identifies the small steps and the order that they should be taught. These small steps are adapted from the White Rose curriculum.

3. A progression document which shows clear criteria for **depth** of understanding using the NCETM progression documents.

4. Daily lessons can be seen through the teaching slides. These support mental strategies, guided practice and independent application. Children are then further challenged through depth tasks.

5. Pre-teach sessions take place to support children who need additional support to access the main content of the session.

6. Opportunities are provided within each objective for children to access **fluency, reasoning and problem solving** activities. These in turn will allow children opportunities to become confident mathematicians.

7. End of unit assessments are completed to identify gaps in pupils learning, which are then closed through intervention and pre-teach sessions.

8. White Rose end of term assessments are completed at 3 points in the year to identify how children are able to independently apply the skills they have learned.

9. Using the Educater assessment system which tracks children's progress towards achieving **depth** of learning in the milestones.

Implementation

The Curriculum is the whole learning experience offered by the school. It is not just the lessons and activities which are planned and taught. It also includes the ethos for learning i.e. the attitudes and loving four values we expect implicitly in all lessons through our super 6 learning behaviours. At St Mary Magdalene Primary School, we aim to teach our children how to grow into independent learners, who can also work and co-operate with others while developing their knowledge and skills, so they can achieve their full potential.

EYFS

In Reception and Nursery, The CoEL have inspired our own set of learning behaviours that we believe matter most to our EYFS children at St Mary Magdalene and help our children to be successful learners. These are referred to as our 'Learning Gems'

They consist of:

- Solve my own problem
- Talk about my learning
- Work with others and on my own
- Keep trying even when it's tricky

We encourage all children to develop and demonstrate these through their work and play. They are a set of behaviours for the children to aspire towards and activities within our EYFS curriculum are designed to encourage the children's development towards competency and confidence in these. These are constantly referred to in class provision so the children can develop the understanding of how we learn.

Our learning behaviours 'Standing together six' which we believe children should display when engaging with the curriculum, consist of:

- Enthusiasm
- Reflective
- Inquisitive
- Risk taker
- Aspiration
- Collaboration

Teaching 'Quality first teaching' linked to teaching standards:

All teachers:

1. 'Know where their children are' through the use of concise **formative and summative assessment**, prior learning, assessment, maths talk.

2. 'Understand where their children need to be' through a **secure understanding of year group expectations** and/or pre key stage expectations and incisive, ongoing assessment

3. 'Know how they are going to get them there' through the use of a range of strategies, starting with clear modelling, to promote independence, **mastery** and high expectations of ALL.
4. Effectively deploy adults, specifically during introductions, plenaries & catch-up sessions
5. Plan for progression during and between lessons.

Learning – Children will develop a love of learning through our maths lessons, which will enable to them to work towards mastery and have problem solving opportunities every session, regardless of their level or ability. Children will use our standing together 6' as a tool to assist them in their learning.

Resources

The Maths leader ensures with other subject leaders, that their areas are well resourced and that resources are appropriate to the theme and deepen learning of skills and understanding of content. Resources are available in a central location and are used regularly to motivate children, spark their imagination and to maximise learning opportunities. IPads are used to support and enhance learning in different areas.

Assessment and Recording

Our Maths curriculum is recorded and assessed in different ways these include:

- Maths books
- Practical activities evidenced by photographs
- End of block assessments
- End of term assessments

Staff will use the evidence provided by children and input this evidence into our Educater system.

Christian Distinctiveness

As a Church of England school, we encourage children to live up to the Christian values. These are taught and embedded through the curriculum and learning 10.

Monitoring and Review

The Maths Leader will regularly monitor and review teaching and learning of the curriculum in accordance with the School Improvement Plan, recommendations from Ofsted, National Curriculum reviews and following consultation with Governors and teaching staff.
Planning, evidence of work and observations of teaching and learning are regularly monitored by the Headteacher, Senior Leadership Team and Subject Leaders. This monitoring enables the school to review and improve current practice on a regular basis. All members of staff are aware that we are continually developing all aspects of learning and teaching to ensure excellent provision for children. Children also have the opportunity to evaluate both the curriculum and their own progress; the feedback from this is used to mold future teaching and learning.
Governors are kept informed of developments and priorities through regular meetings and the named Governor for Maths works closely alongside the Maths leader, contributing to the Head teacher's report and to priorities on the School Improvement Plan.

Parental Involvement

Parents/carers are viewed as active supporters of learning in our school. They are encouraged to be part of school life through a range of activities which take place in school. Through our curriculum drivers we have developed a parent directory so that we draw on their experiences and expertise to maximise creative learning opportunities.
Parents/carers have regular contact with staff and are able to discuss their child's progress on a regular basis. Additionally, the school requests that every parent/carer support their children by working with them at home on activities in their learning log which encourage children to present their own way.

Overview of Calculation Approaches

Early Years into KS1

- Visualisation to secure understanding of the number system, especially the use of place value resources such as Base 10, Numicon, 100 Squares and abaci.
- Secure understanding of numbers to 10, using resources such as Numicon, Tens Frames, fingers and multi-link.
- Subitising to begin making links between the different images of a number and their links to calculation.
- Practical, oral and mental activities to understand calculation.
- Personal methods of recording.

Key Stage 1

- Introduce signs and symbols *(+ , -, x, ÷ in Year 1 and <, > signs in Year 2)*
- Extended visualisation to secure understanding of the number system beyond 100, especially the use of place value resources such as Base 10, Place Value Charts & Grids, Number Grids, Arrow Cards and Place Value Counters.
- Further work on subitising and Tens Frames to develop basic calculation understanding, supported by Numicon and multi-link.
- Continued use of practical apparatus to support the early teaching of 2-digit calculation. For example, using Base 10 or Numicon to demonstrate partitioning and exchanging before these methods are taught as jottings / number sentences.
- Methods of recording / jottings to support calculation (e.g. partitioning or counting on).
- Use images such as empty number lines to support mental and informal calculation.

Year 3

- Continued use of practical apparatus, especially Place Value Counters, Base 10 and Numicon to visualise written / column methods before and as they are actually taught as procedures.
- Continued use of mental methods and jottings for 2 and 3 digit calculations.
- Introduction to more efficient informal written methods / jottings including expanded methods and efficient use of number lines (especially for subtraction).
- Column methods, where appropriate, for 3 digit additions and subtractions.

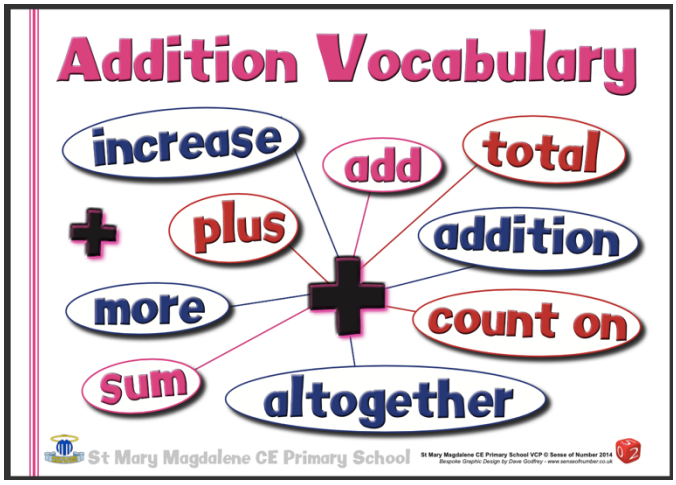
Years 4-6

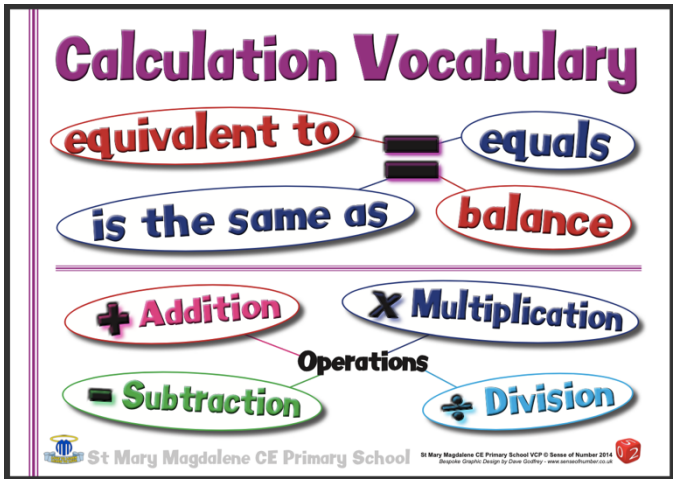
- Continued use of mental methods for any appropriate calculation up to 6 digits.
- Standard written (compact) / column procedures to be learned for all four operations
- Efficient informal methods (expanded addition and subtraction, grid multiplication) and number lines are still used when appropriate. Develop these to larger numbers and decimals where appropriate.

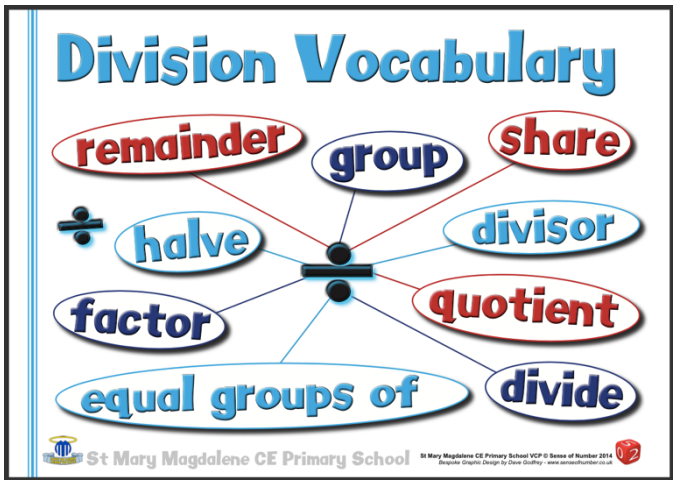
N.B. Children must still be allowed access to practical resources to help visualise certain calculations, including those involving decimals

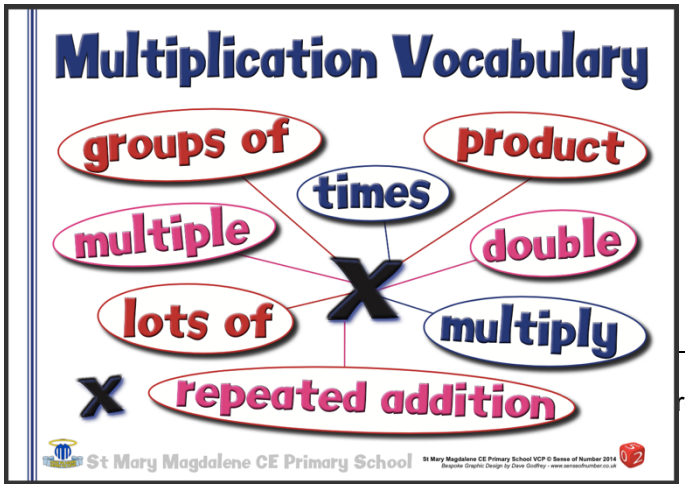
Mathematical vocabulary

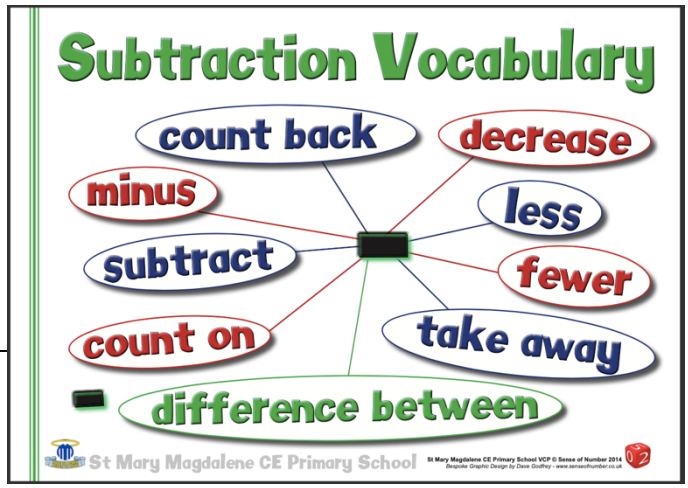
It is essential that children are exposed to the correct vocabulary as they move through the different operations.











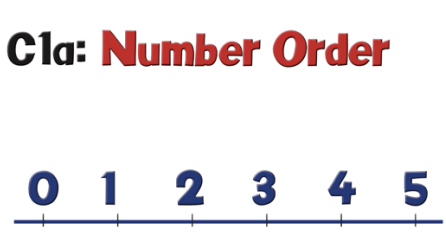
EYFS Methods

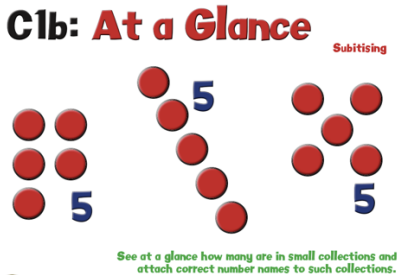
At the end of EYFS children will be assessed on:

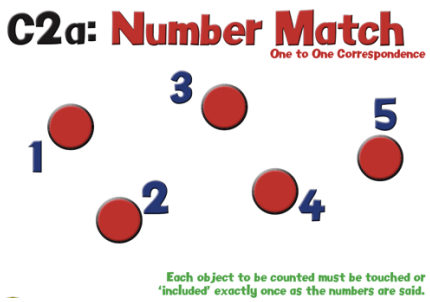
Numbers: children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less that a given number using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

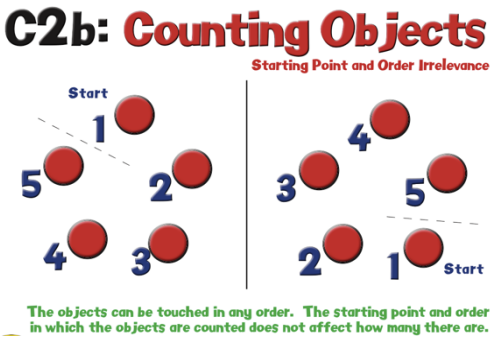
Shape, space and measures: children use every day language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore 12 characteristics of everyday objects and shapes and use mathematical language to describe them.

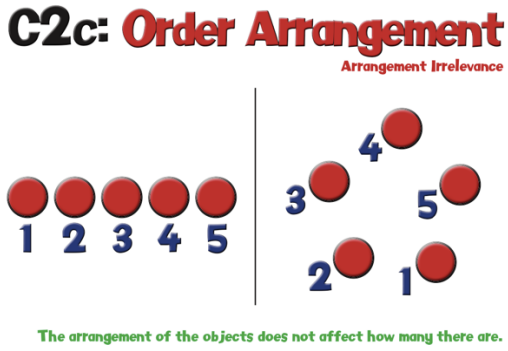
To support these objectives the following methods will be used.

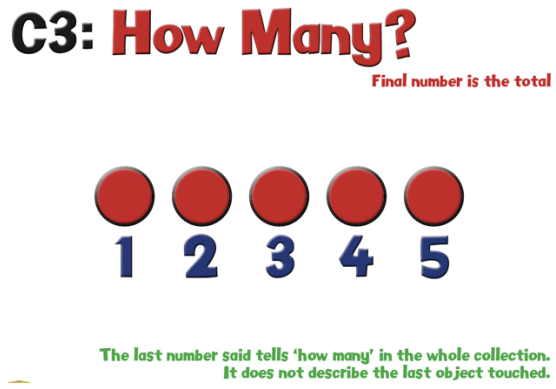












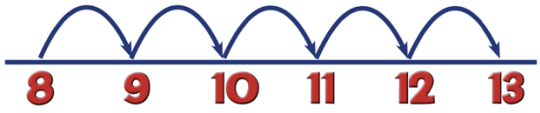
C4: Arranging

Sets of 5

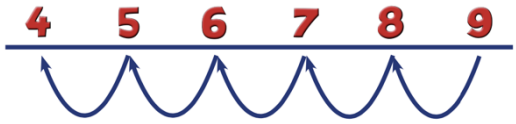
7

C5: Counting Forwards

C6: Counting On



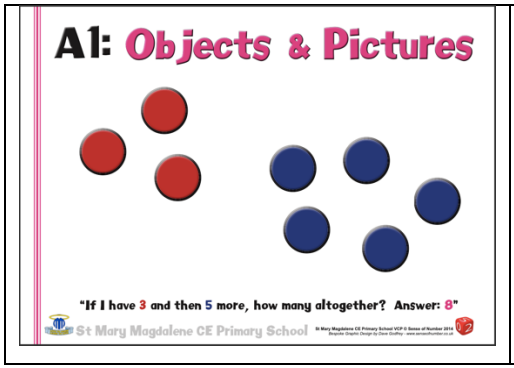
C7: Counting Back

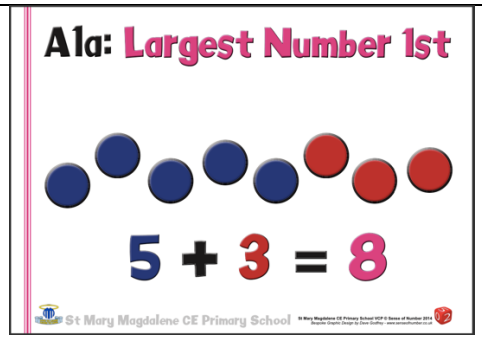


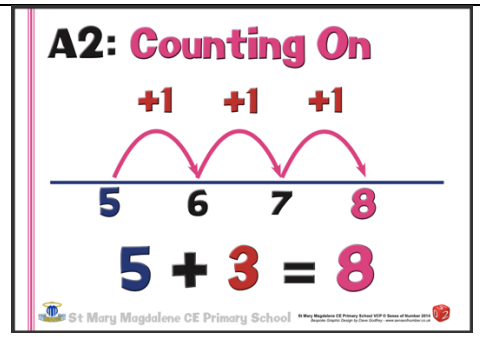
C8: Counting in Steps

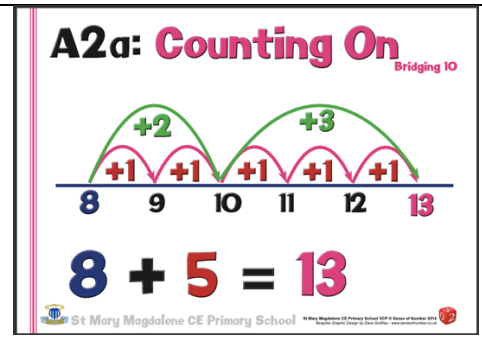
Addition in EYFS

Children will add using a range of practical equipment and begin to record simple addition calculations.



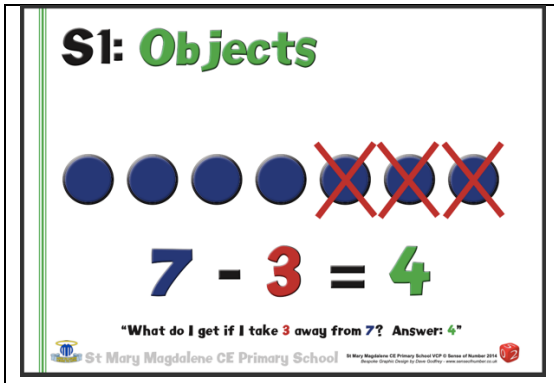


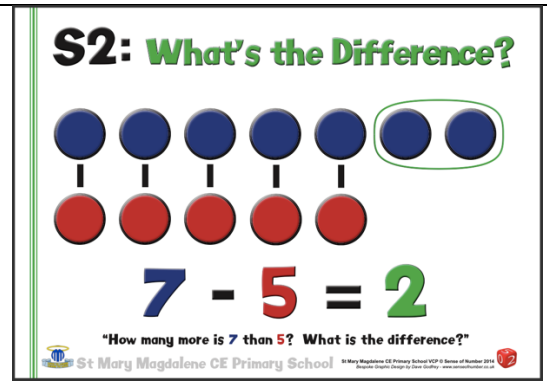


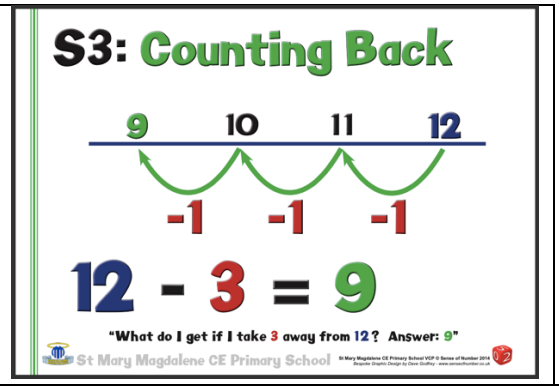


Subtraction in EYFS

Children will be encouraged to use practical items to support their early development and represent ideas. It is vital they see subtraction as 'finding the difference' between two numbers.

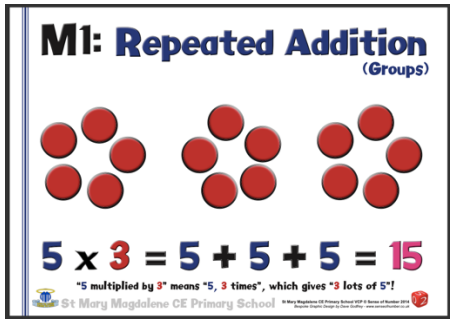






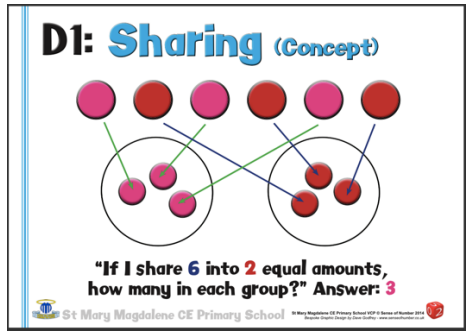
Multiplication in EYFS

Children will be encouraged to use practical items to support their early development and to be able to represent their ideas. It is vital that they see groups of the same number, they will not be using the term 'multiplication' at this stage.



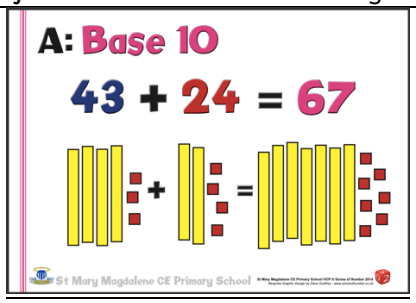
Division in EYFS

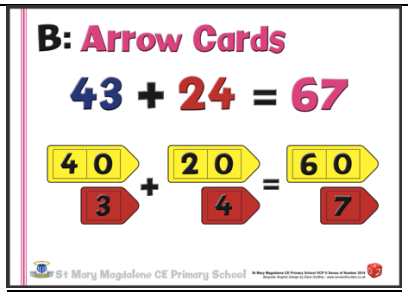
Children will be encouraged to use practical items to support their early development and to be able to represent their ideas. They will practise sharing items out fairly and counting how many are in each group.

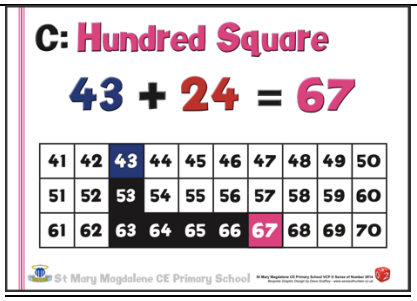

D1: Sharing (Concept)
"If I share 6 into 2 equal amounts, how many in each group?" Answer: 3
St Mary Magdalene CE Primary School

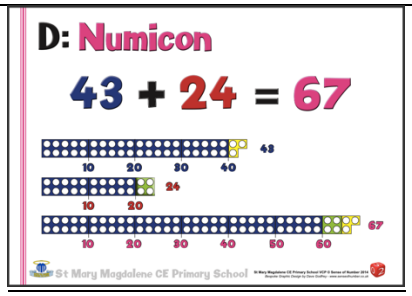
Using resources to support the four operations

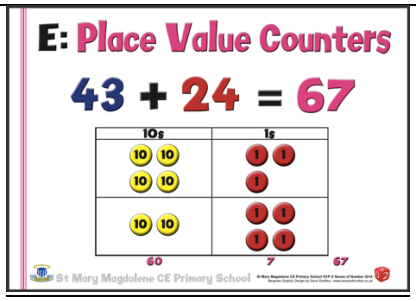
We would expect that children use a range of concrete and pictoral representations to solve problems using the four operations. The resources used in different year groups would depend on the skill being learnt and the ability of the children.
Some of the resources children may use are:

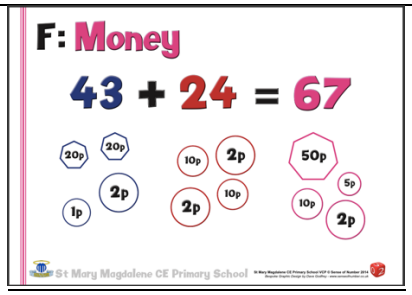










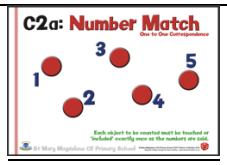
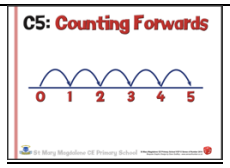
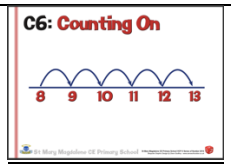
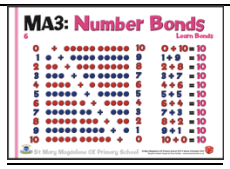
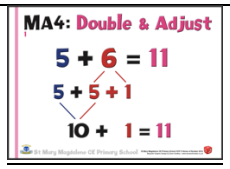
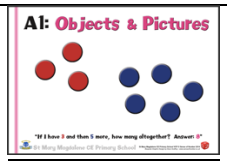
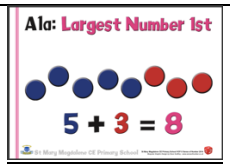
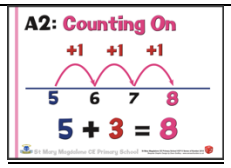
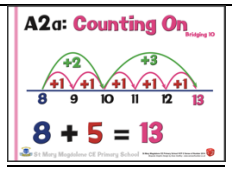
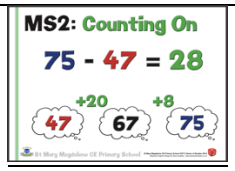
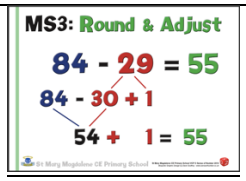
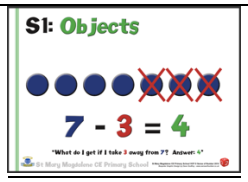
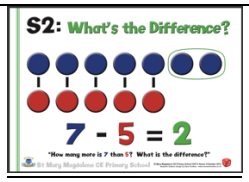
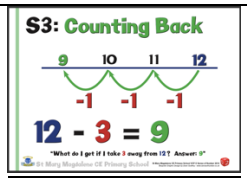
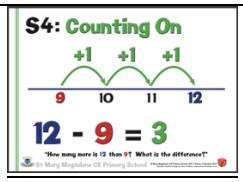
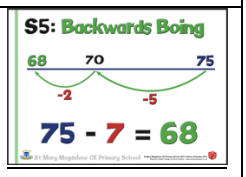
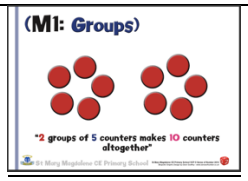
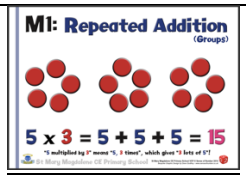
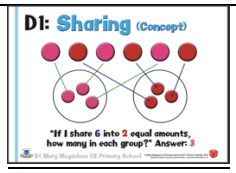
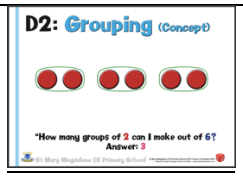


Progression of methods in KS1 and KS2

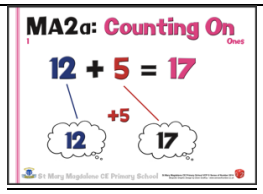
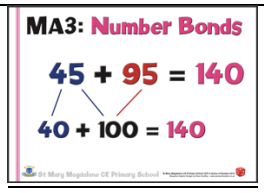
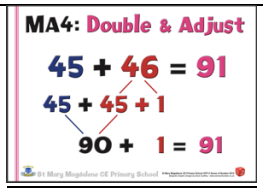
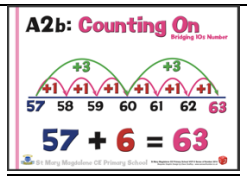
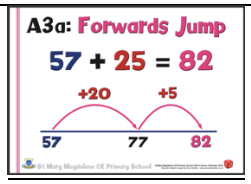
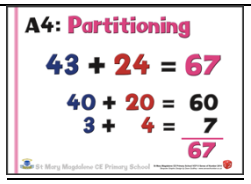
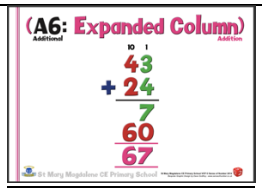
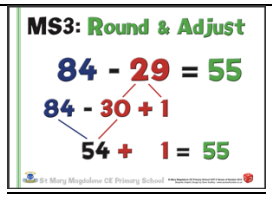
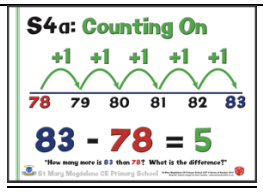
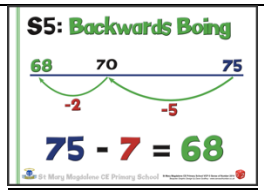
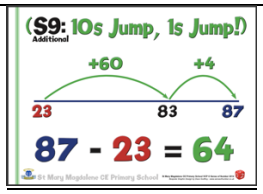
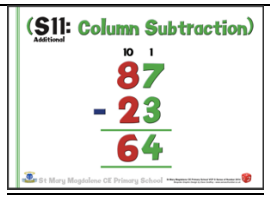
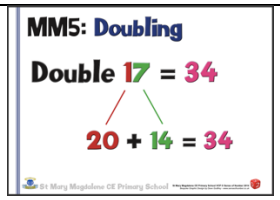
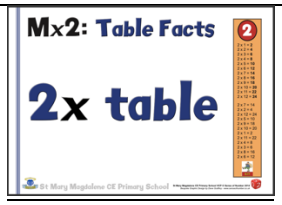
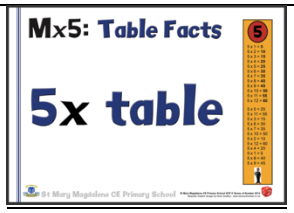
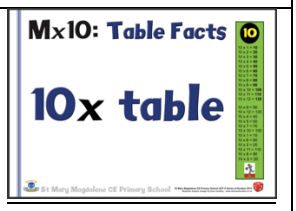
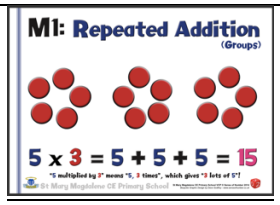
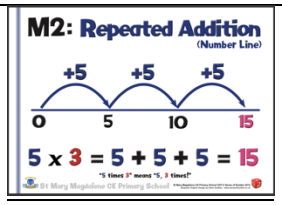
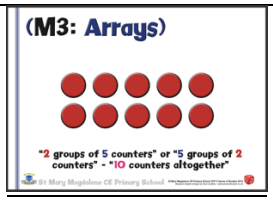
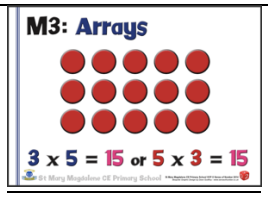
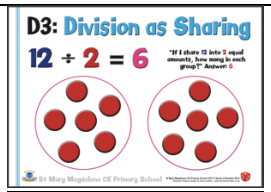
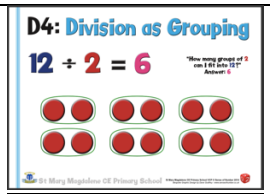
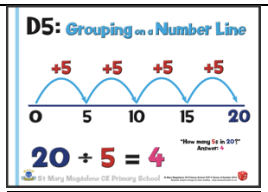
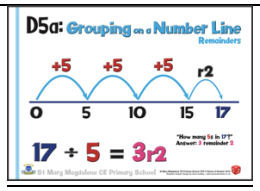
The following pages show the progression of methods that are used in all year groups. Methods have been broken down into:

- Counting
- Mental addition
- Addition
- Mental subtraction
- Subtraction
- Mental multiplication
- Multiplication
- Division.

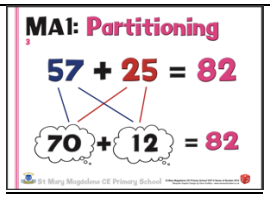
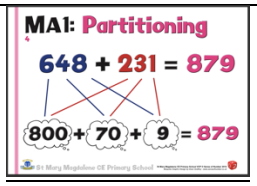
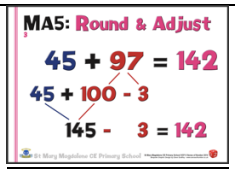
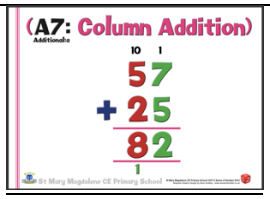
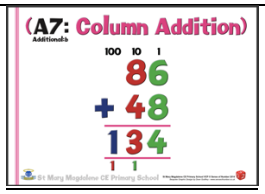
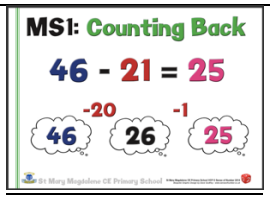
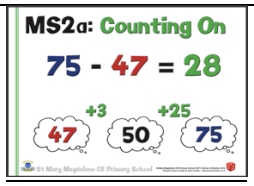
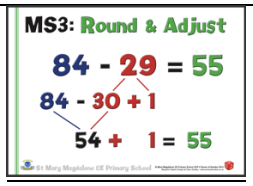
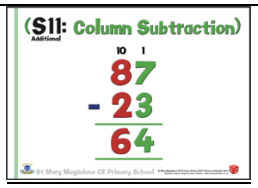
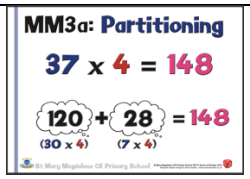
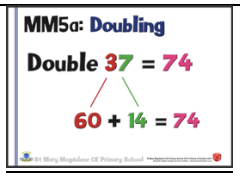
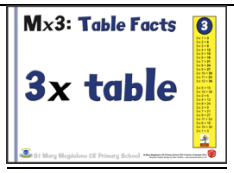
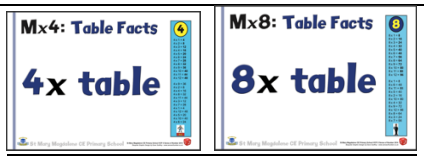
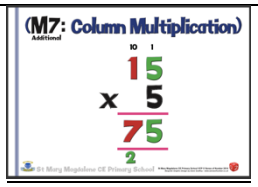
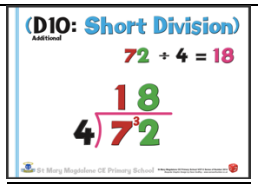
Year 1

Area of Maths	Strategies used				
Counting					
Mental addition					
Addition					
Mental subtraction					
Subtraction					
Mental multiplication	Count in 2, 5 and 10				
Multiplication					
Division					

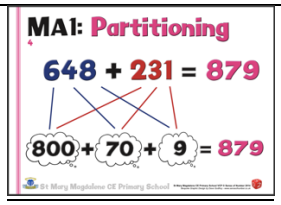
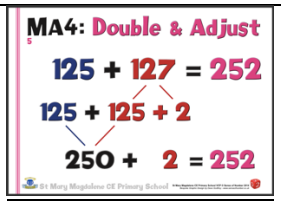
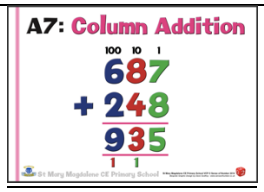
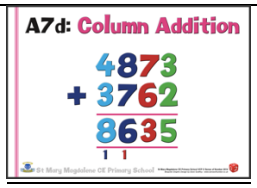
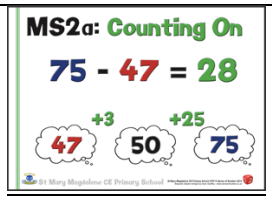
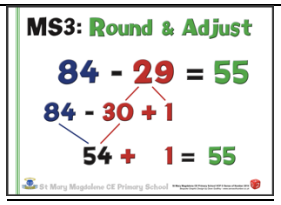
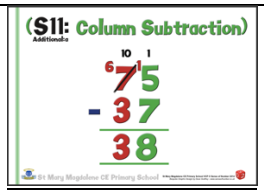
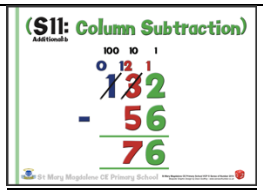
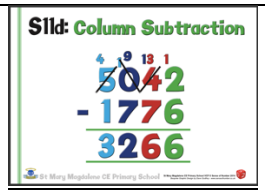
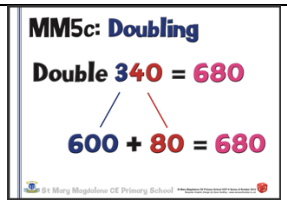
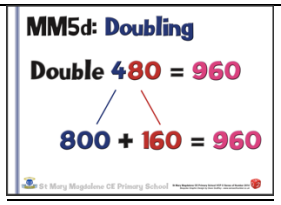
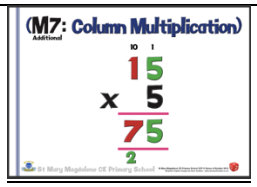
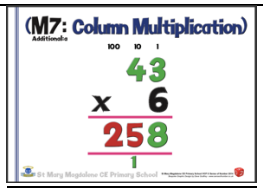
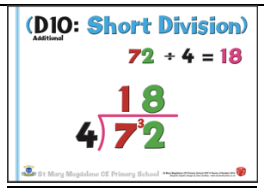
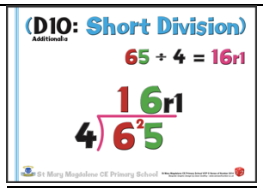
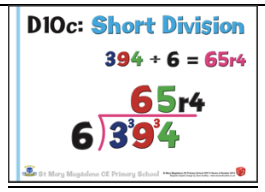
Year 2

Area of Maths	Strategies used			
Mental addition				
Addition				
Mental subtraction				
Subtraction				
Mental multiplication				
Multiplication				
Division				

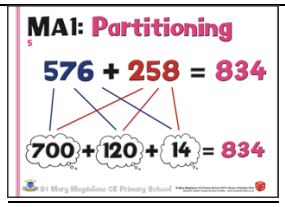
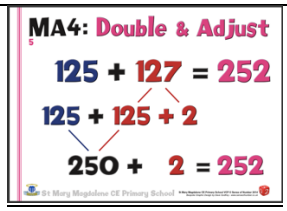
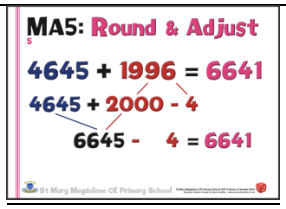
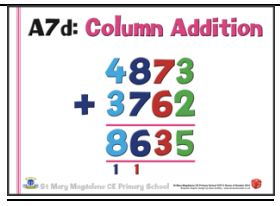
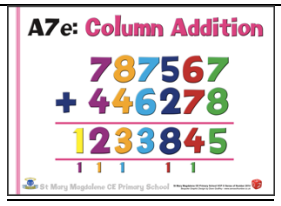
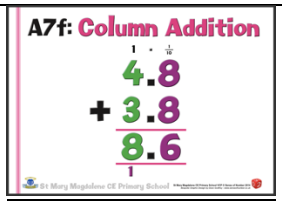
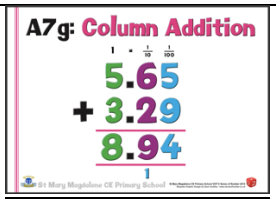
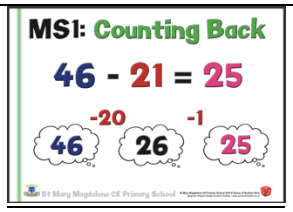
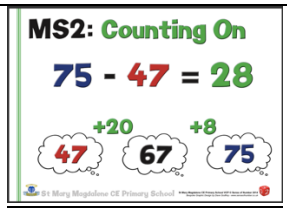
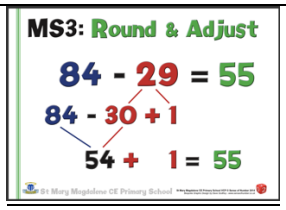
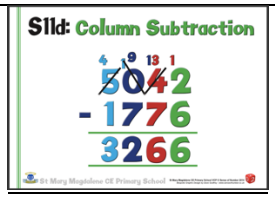
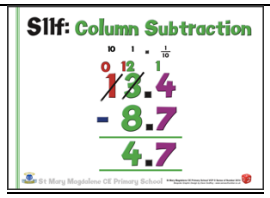
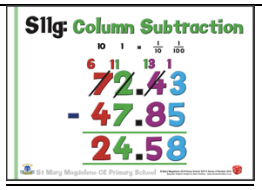
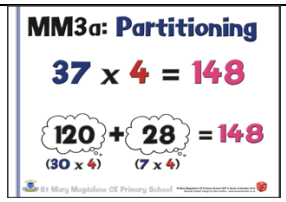
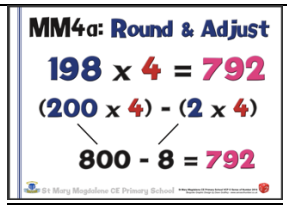
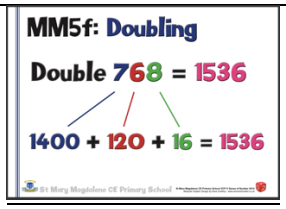
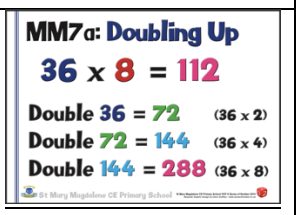
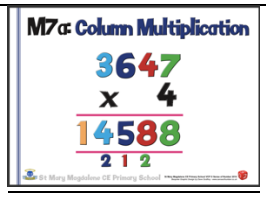
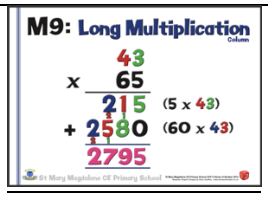
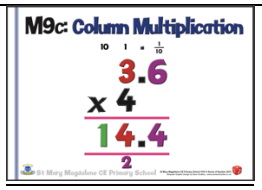
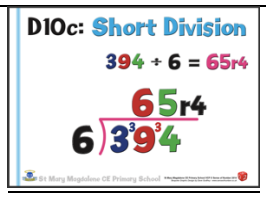
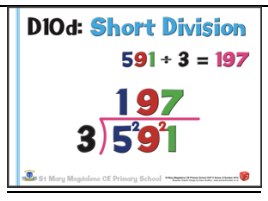
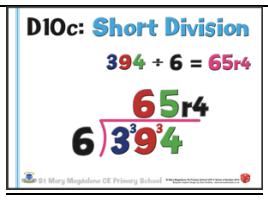
Year 3

Area of Maths	Strategies used			
Mental addition				
Addition				
Mental subtraction				
Subtraction				
Mental multiplication				
Multiplication				
Division				

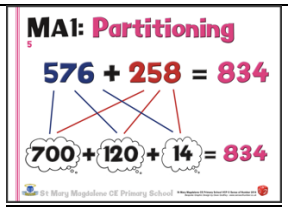
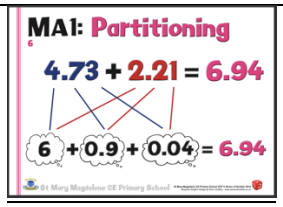
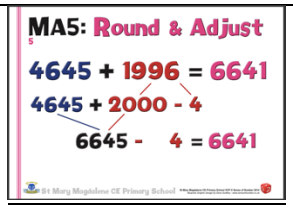
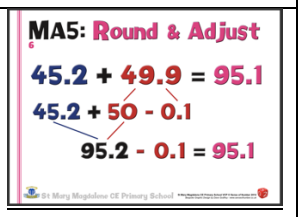
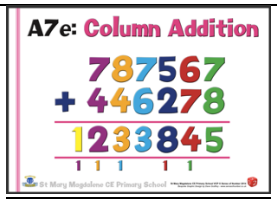
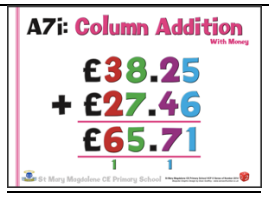
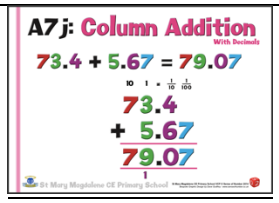
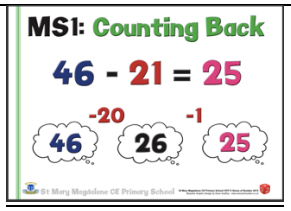
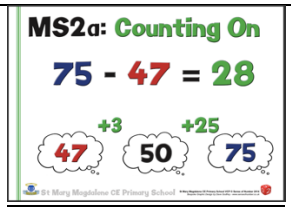
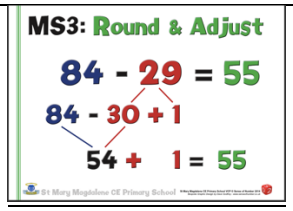
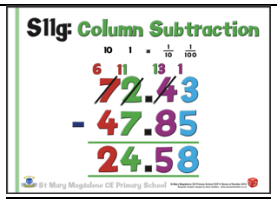
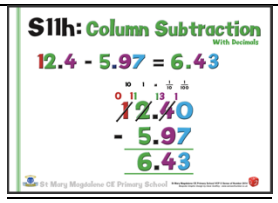
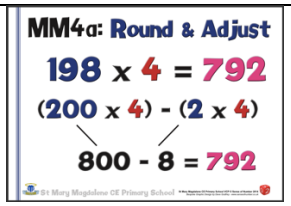
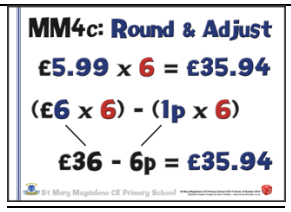
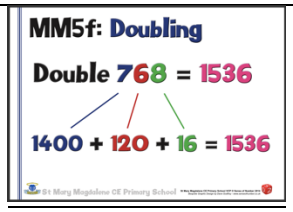
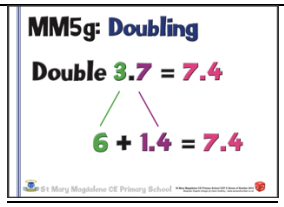
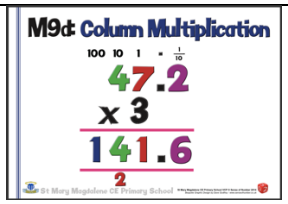
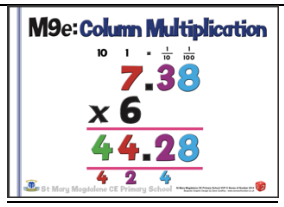
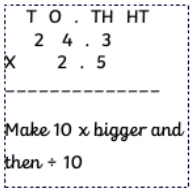
Year 4

Area of Maths	Strategies used			
Mental addition				
Addition				
Mental subtraction				
Subtraction				
Mental multiplication			Knowledge of all times tables up to 12x12 in preparation for the Multiplication check.	
Multiplication				
Division				

Year 5

Area of Maths	Strategies used			
Mental addition				
Addition				
Mental subtraction				
Subtraction				
Mental multiplication				
Multiplication				
Division				

Year 6

Area of Maths	Strategies used			
Mental addition				
Addition				
Mental subtraction				
Subtraction				
Mental multiplication				
Multiplication				
Division