

St. Michael Catholic Primary and Nursery School Maths Policy



I came so that you may have life, life in all its fullness" John 10:10

St Michael Catholic Primary School and Nursery is a Catholic family of faith following the teachings of Christ. We strive to create an environment where all members of our school community respect the values of: Church, Independence, Resilience, Caring, Learning and Enjoyment for all. Belief in these values will nurture all as individuals and instil in them the confidence to meet their full potential, providing them with the best grounding for their future place in an ever-changing world.

Policy Date	September 2026
Signed by Head Teacher	Mrs N Collins
Review Date	September 2027

Rational

At St Michael's, we strive for pupils to develop their Mathematical understanding to fulfil their potential truly. We believe at St Michael's that children should become confident in their mathematical skills to assist their development in all other areas of the National Curriculum. The National Curriculum clearly states that it is vital to develop pupils' numeracy and mathematical reasoning in all subjects to understand and appreciate the importance of mathematics. The children at St Michael's should not just be given a foundation for early Maths learning, but the opportunity to apply their skills to a range of different situations, seeing how their knowledge of number can be used within a wide range of different contexts, best supporting children for future Maths and life learning.

St Michael's RC Primary School:

- Recognises the effect that a confident, fluent, and coherent understanding of Maths will have on a pupils' progress, both inside and outside the school environment.
- Understands how a strong grounding in Maths will impact the future learning and development of a pupil in all aspects of their life
- Provides a balanced and broad curriculum,
- Ensures that all staff members are aware of planning, assessment, teaching and learning requirements for the Maths curriculum.
- Ensures that all pupils know how to calculate, reason, justify and explain their answers
- Ensures that all pupils understand all elements of Maths, as per the national curriculum.

Teaching and Learning

Fluent in 5/flashback four/ Counting stick/ Recap and Recall of previous learning:

Each Lesson should begin with a recap/consolidation of previous learning. Next, there are a few arithmetic based questions where children employ a range of mental and written methods to recap previous learning and for the teachers to identify areas of weakness; this can be through the form of Fluent in 5, Flashback four, Counting stick, etc. Children have approximately 5 minutes to complete these questions, trying but not explicitly using the preferred method (w/m). This will also allow teachers to assess evidence where children can use mental methods in their calculations.

The National Curriculum states that children should 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.

- Provides regular practice of mental and written arithmetic skills is essential to keep calculation skills fresh as more emphasis in lessons is given to problem-solving and reasoning. It is important to revisit calculations.
- It is a way of seeing children's ability to use mental strategies.
- To combat children's ability to complete tests with time constraints.
- The children should complete this in the first 5 minutes of a daily maths session recognising the calculations that can be completed mentally and those that require written calculations.

Sharing the Lesson's learning objective.

Teachers need to share the learning objective with the class and focus on any key vocabulary mentioned (mainly as the children write the LO numbers into the books). It will allow the children to understand what they are learning about and feel confident to ask questions about the meaning of key vocabulary. For example, teachers may want to ask, "Are there any words in today's LO that some children might not know the meaning of?" This takes the ownership of a certain child's misunderstanding away from them, e.g., "Someone might not know what equivalent means." This will then allow the Teacher to ascertain the areas and vocabulary that still need work and give children the opportunity to fully understand the objective they are covering from the beginning of the Lesson.

Counting Stick/Number Fluency

Mathematics is an interconnected subject in which pupils need to move fluently between representations of mathematical ideas. Therefore, there should be a number/times table focus for each week. A counting stick can be used to support children in becoming more fluent in their number facts, whether this is numbers to 10/20 or times table facts. All children will benefit significantly from counting daily and exploring position on the counting stick. This causes increased number sense through reasoning, allowing them to clarify and test their knowledge and understanding for themselves.

Classes mustn't simply count up/down. Questioning during this is vital. E.g., 7, 14, 21, 28, 35, 42, 49 'What can you tell me about the number 49?'... "It is a squared number." "It is the 7th multiple in the 7 times tables." "It is an odd number." "It has 4 tens and 9 ones." "It is 10x

larger than 4.9."

This will allow automatic differentiation in the children's answers and produce huge language focus and benefits.

I do, We do, You do

- All classes to continue to employ an I do, we do, you do approach, giving children a chance to see a modelled answer of the question, before doing it with the Teacher and then independently

- Your 'I do, we do, you do' approach should also include a great focus on vocabulary throughout, ensuring this is referred to on your learning/working walls. This will ensure children are using the correct vocabulary and can reason and link in their mathematical thinking. This should also connect across the year groups, allowing children to develop and extend their learning. It is also vital that teaching links are made explicitly across topic areas.

I do:

You are modelling the process. You should ensure lots of teacher talk (modelling the correct vocabulary). This demonstrates your steps to success here too.

We do:

Children support you in completing another question type, following the structure and vocabulary of your modelled example.

You do:

The children complete a final question independently/in small groups. Again, they should be following your vocabulary and structure for support. This is a time for you, as CT, to employ AFL to gain an understanding of those children who still need help -forming part of your teach group/additional input support on the carpet.

- Use AFL during the 'you do' section to work with children who are still unsure, ask these children to come onto the carpet for additional input and instruction, use fans or thumbs up, down or sideways to show this.

Notes on teacher inputs.

The National Curriculum affirms that pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. Therefore, throughout every Lesson, CT inputs should focus on mathematical vocabulary and problem solving/reasoning.

- Vocabulary should be explicitly taught during lessons, and key vocab should be written down during the Lesson and then displayed on the maths learning wall while discussing it with the children for them to refer to during the Lesson and following lessons. This way, children will

gain a deeper understanding of what they are being asked to complete, and they will be able to create links across the curriculum.

- Vocabulary in worded problems should focus (not number) on the beginning of the problem. Use insignificant numbers to ensure children are aware that it is not always the case that all numbers are significant in a problem. By focusing on the vocabulary, children will recognise the operation required and which numbers will be necessary to solve the problem.
- Children should be exposed to numerous ways to support them in working out the problem.
- Manipulatives should be available in all year groups for all children during maths lessons.
- Drawing the problem - progressing into drawing a bar model.

By doing this, children will have a bank of resources to draw upon when they encounter more challenging problems as they progress through the curriculum.

- **Every objective** should see **every child** solving a problem in their activity, not just calculations. All children should have the skills to approach more complex problems and reasoning-based questions. This can be supported by the skills they have acquired above.

Steps to Success

The children should generate steps to Success, following the modelling you have done during the input in your 'I do, We do, You do' section. These STS should be written down and displayed on washing lines/learning walls for children to refer to during and following lessons.

Activities

Activities should be adapted to suit, but not stifle, the children's abilities. As mentioned previously, all children should be exposed to reasoning and problem solving within each objective to ensure depth and breadth of the curriculum.

A reasoning problem could be answered through jottings, which demonstrate the child's

understanding and then support to use vocabulary to explain. Again, vocabulary during these activities is key. It isn't just about getting the answer right; it is about how they have reasoned and explained how they have achieved this.

All children should be given the opportunities to apply their understanding to reasoning questions to deepen their Mathematical understanding by explaining and justifying their answers. All teachers use white Rose Premium resources to provide all pupils with high-quality reasoning resources to help give pupils a greater depth of understanding.

Pupils who grasp concepts rapidly should be challenged by offering rich and sophisticated problems before any acceleration through new content. Those, who are not sufficiently fluent with earlier material, should consolidate their understanding, including through additional practice, before moving on. This may need additional interventions.

Cross-Curricular Activities

At St Michael's, we do not believe that Maths learning is not a stand-alone subject and can be taught in conjunction with a range of other subjects providing pupils with the opportunities to make links between what they are learning; both with other areas of Mathematics and other areas of the curriculum. We believe that children need to make independent connections between what they are learning in Maths and other topics.

Outdoor Learning

We at St Michael's want our children to be active learners, and by taking their learning outside, we find that our pupils show extra motivation and eagerness for their Maths learning. This allows them to problem solve in ways we do not always necessarily see inside the classroom, building their ability to communicate with others using Mathematical language as they work alongside one another.

Plenary

Plenaries should be included at the end of every Lesson. These could take form in a number of ways:

- Another reasoning-based question - highlighting the key aspects of that Lesson's objectives and used as AFL and self-assessment for the children. Focusing on the language the children are using and have used throughout the Lesson.
- Misconception – Putting the possession on the Teacher having made a mistake, children can reason what mistake you have made and identify whether they have made these mistakes themselves.
- Links with other curriculum areas – Children can identify the skills they have used in

that Lesson and understand ways to support them in transferring them onto their new learning.

Feedback

Children's work should be marked, using St Michael's marking and feedback policy, before the following Lesson. By doing this, you will be able to identify those who need moving on and those who still need additional help and possible interventions that will allow them to continue to progress as the lessons continue.

Interventions

Following your AFL (made throughout the Lesson), marking, and feedback, any struggling children who have not met the learning objective must be given a '*Pink slip intervention*' or an opportunity to address the misconceptions. These interventions should occur on the same day or early the next day.

Pre- and Post-Topic Assessment

Before teaching a new topic, each child should complete a pre-topic assessment.

- This data should inform your planning. It will highlight areas where pupils need additional support and areas where they are more confident.
- If only a small number of pupils struggle with a specific objective, address this through targeted intervention or incorporate it into mental/oral starters.

Use the assessment data to:

- Plan focused teaching for the topic.
- Identify objectives for daily intervention groups.
- Ensure pupils receive support on the areas they need most.

After completing the topic, pupils should complete a post-topic (end-of-term) assessment to measure progress and inform future planning.



A Guide to Maths at St. Michael Catholic Primary and Nursery School



This document outlines the expectations of how we teach Mathematics at St. Michaels. It includes the key strategies we use and what Mathematics looks like in the school.

This guide includes information about the following:

- Using White Rose Maths Schemes of Learning
- Using Sonar
- Unit Front Covers/ Knowledge Organisers
- Assessment
- Coloured Boxes
- Concrete, Pictorial and Abstract
- Resources
- NRich
- Learning Walls
- Times Table Rockstars
- Lightbulb Questions
- Book Scrutiny Feedback
- Making Maths Exciting
- Cross-Curricular Maths
- Purple Mash

White Rose Schemes of Learning

The White Rose Scheme of Learning is a highly effective, mastery-focused approach to teaching mathematics, designed to build deep understanding and confidence in learners. At the heart of every lesson, there is a clear structure that starts with a starter to develop fluency and recap prior learning, such as Counting Sticks, Flashback 4, or Fluent in 5. This is followed by an Activate phase, where students explore and engage with new concepts in a curious and hands-on way. The Explain stage involves explicit teaching using the Concrete, Pictorial, Abstract (CPA) approach, ensuring clear modelling and the use of appropriate language and sentence stems. After guided practice through I do, we do, you do, students move on to independent practice, which includes fluency, reasoning, and problem-solving

activities. Each lesson concludes with a light bulb question—a challenge that deepens thinking and extends understanding. Throughout the lesson, formative assessment for learning (AfL) and reflection are used to ensure all students grasp the concept and achieve mastery.

Using Sonar

When assessing children on Sonar, assess the units you have taught within that half term. Please ensure you look through children's books to find the evidence of children achieving each objective so that assessments are accurate. Pre and Post assessments should also be used to inform your judgement.

Sonar can be used in a range of ways to support the effective teaching of maths.

Unit Front Covers/ Knowledge Organisers

At the beginning of each unit, a unit front cover should be stuck in each child's book.

What to include on unit covers:

- Title of Unit – e.g., Number and Place Value
- Numbered learning objectives the children will cover within this unit
- Add pictures of expected criteria if you wish
- Key vocabulary
- Pre-Assessment Score and Post Assessment Score

Assessment Pre/Post Assessments

End of Topic assessments are provided by White Rose.

These are to be completed before the topic as a formative assessment and repeated soon after the unit is completed as a summative assessment.

You should use the pre-assessment to inform your planning and interventions that will need to be implemented into your planning. If children are unable to answer any questions, pre teaching can occur.

Please note down the children's pre-assessment score and post-assessment score on your unit front cover each time to show progress. Please use this to inform your planning.

group, depending on the child's level. E.g., if they are a Year 4 child working at a Y2 level, you would use the assessments from Y2. If they score highly on these, they can complete the Y3 assessment. *Their daily work within the unit would reflect the objectives they should be working on.*

Termly Assessments

At the end of every term, children need to complete a White Rose Maths progress check.

There are two papers; an arithmetic paper and a reasoning and problem-solving paper.

These tests are to inform your judgements on Sonar – please use these to mark off the objectives on Sonar and to do a steps data drop.

Maths Resources

All classrooms have been provided with resources to aid learning. Teachers need to confer with colleagues in advance if you need to borrow any resources in order to support a topic. If you are aware that resources are unavailable. i.e., are not in school then ensure that you make the Maths Lead aware and they will endeavour to obtain your request if possible. All teachers need to audit their classroom at the start of each term to ensure that they can request what they may need beforehand.

Stem Sentences

A stem sentence provides children with the language they need to access a problem, these need to be on display and children can refer to these when explaining mathematical concepts and solving problems. These stem sentences should also be evident in the children's work.

Coloured Keys

We use WRMH Schemes to plan. These show a range of fluency, reasoning and problem-solving activities that can be used to teach each objective.

Children's independent work should be given in different coloured keys; **Blue for fluency**, **Green for Reasoning** and **Red for Problem Solving**. These activities should be adapted in order to support personalised learning. Once a child has completed fluency, they need to move onto reasoning within the lesson; do not wait until the next day to complete the next stage of learning.



Fluency

Fluency

Fluency is the foundation of every lesson, focusing on developing speed, accuracy, and confidence in applying mathematical skills. It should consist of tasks that are carefully designed to build understanding and proficiency step by step. When planning fluency tasks, consider the '3 and move on rule', where children attempt at least three questions before progressing to more challenging tasks, unless their progression is naturally fluent.

Key Features of Fluency:

- Standard fluency: Direct practice to reinforce key concepts and ensure children develop quick and accurate recall.
- Varied fluency: Providing opportunities for children to encounter concepts in different formats or contexts to deepen understanding and adaptability.
 - For example: representing a problem numerically, visually, or in words.
- Progressive challenge: Questions should become incrementally harder, encouraging children to extend their thinking and application skills.
- Inclusion of word problems: Real-life contexts can be incorporated to ensure fluency is applied meaningfully.

Fluency ensures children have a strong grasp of the basics while preparing them to apply their understanding in reasoning and problem-solving tasks.



Reasoning

Reasoning

Reasoning should be an integral part of every lesson, as it helps deepen children's understanding and supports their ability to think critically. It involves activities where children explain, justify, or prove their answers, as well as spot patterns or make connections. These activities can be adapted from the WRMH Schemes and should follow fluency tasks as a natural progression.

Types of Reasoning in Maths:

- Justify: Provide logical reasons or evidence for answers.
- Explain: Describe the method or steps used to solve a problem.
- Prove: Use examples or mathematical rules to confirm that an answer or idea is correct.
- Identify patterns or relationships: Spot trends or connections in numbers, shapes, or operations.
- Make conjectures: Suggest possible outcomes or solutions based on reasoning and patterns.

<https://www.ncetm.org.uk/classroom-resources/pm-reasoning-skills/>



Problem Solving

Problem Solving

Problem solving should be embedded in every lesson, as it is a key skill that enables children to apply their mathematical understanding in a variety of contexts. There are two main types of problem-solving questions:

- Closed-ended problems: Questions with a definitive answer.
- Open-ended problems: Questions that have multiple possible solutions or approaches.

Types/Strands of Problem Solving in Maths:

- Finding all possibilities: Exploring all possible outcomes or combinations.
- Logic problems: Using reasoning and deduction to solve puzzles or challenges.
- Word problems: Solving problems presented in real-life or written contexts.
- Visual problems: Using diagrams, charts, or shapes to find solutions.
- Pattern problems: Identifying patterns and using them to make predictions or solve challenges.
- Trial and improvement: Testing possible solutions systematically to find the best one.

For further support and resources on problem solving, visit:

http://www.stopsproblemsolving.co.uk/main_page/RUCSAC/g.html

Concrete, Pictorial and Abstract

The CPA method involves using actual objects for children to add, subtract, multiply or divide. They then progress to using pictorial representations of the object, and ultimately, abstract symbols.

Children often find maths difficult because it is abstract. The CPA approach helps children learn new ideas and build on their existing knowledge by introducing abstract concepts in a more familiar and tangible way.

Concrete is the ‘doing’ stage, using concrete objects to solve problems. It brings concepts to life by allowing children to handle physical objects themselves. Every new abstract concept is learned first with a ‘concrete’ or physical experience.

Pictorial is the ‘seeing’ stage, using representations of the objects involved in maths problems. This stage encourages children to make a mental connection between the physical object and abstract levels of understanding, by drawing or looking at pictures, circles, diagrams, or models which represent the objects in the problem.

Building or drawing a model makes it easier for children to grasp concepts they traditionally find more difficult, such as fractions, as it helps them visualise the problem and make it more accessible.

Abstract is the ‘symbolic’ stage, where children are able to use abstract symbols to model and solve maths problems.

Once a child has demonstrated that they have a solid understanding of the ‘concrete’ and ‘pictorial’ representations of the problem, the teacher can introduce the more ‘abstract’ concept, such as mathematical symbols.

<i>Problem: There are 8 flowers in the vase. Hannah has 2 flowers in her hand.</i> <i>How many flowers are there altogether?</i>		
<u>Concrete</u>	<u>Pictorial</u>	<u>Abstract</u>
Using actual flowers and then moving onto using counters, cubes, Numicon etc. to represent the flowers.	Use drawings of flowers, or pictures of objects such as multi-link blocks or counters, to represent the actual object. You could also use diagrams to support learning such as bar models and part/whole models. Use the Calculation Policy to get ideas.	$8 + 2 =$ When doing abstract, consider moving the equals sign around and using missing numbers in the sum. $\underline{\hspace{1cm}} = 8 + 2$ $2 + \underline{\hspace{1cm}} = 10$ $\underline{\hspace{1cm}} + 8 = 10$

NRICH

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. NC2014 Therefore, it is necessary to make our lessons purposeful and involve real life problems into our lessons. Nearly every other task on the NRICH site fits most of the criteria for a rich problem.

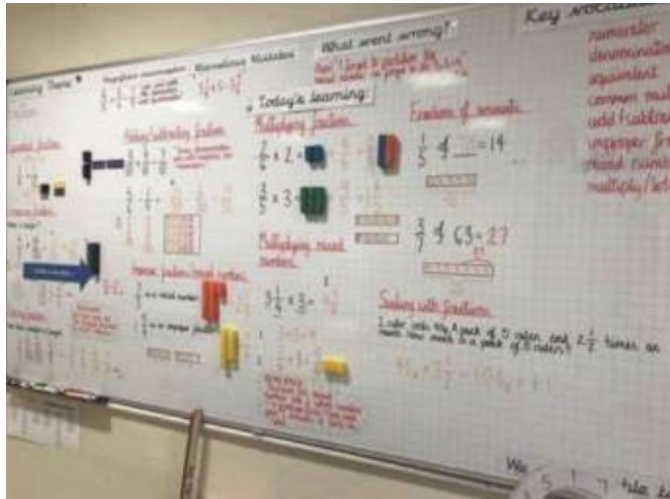
Each problem provides you with the teachers' notes so you can get a sense of how a lesson might proceed, but given the freedom to do so, children can take the question in an unexpected direction so you may be surprised at the outcomes. If you can be open to such results, not only will your children learn more and become more independent, but you will be helping them to see mathematics as the creative subject it is.

<https://nrich.maths.org/curriculum-maps/primary>

Learning Walls

Learning walls should:

- Be relevant to the unit you are teaching
- Be clear and informative
- Have the key vocabulary and sentence stems for the unit displayed
- Have calculations modelled by the teacher – as per the Calculation Policy
- Show the journey through concrete, pictorial and abstract
- Show the journey through fluency, reasoning and problem solving
- Give prompts and reminders children can use to support their learning



Times Tables

Times Tables Check

All Y4 children will have their multiplication skills formally tested from 2021.

Primary-school children are expected to know all their times tables up to 12x12. Under the current National Curriculum, children are supposed to know their times tables by the end of Y4.

TTRockstars

Key

Information

- Each teacher and child create their own rock star avatar and name.
- Students can earn coins by practicing timetables and completing in online competitions. With the coins, they can buy new accessories for their avatar.
- Setting the tables – You can set which tables the pupils face each week in the Garage and Arena games by going to My School > Pupil Setup > Set Schedule.
- Children should be completing 10 studio games each half term to update their rock speed.
- There are four game types; Garage, Studio, Arena and Festival. The garage is the best place to improve their score. The studio is the best place for obtaining a rock speed.

For more information on TTRockstars visit:

<https://ttrackstars.com/page/features>

Book Scrutiny Feedback

Evidence will be looked for in the following areas. Feedback is given as per our marking policy; green for positive evidence found and pink for next steps.

Fluency, reasoning, problem solving	Concrete, pictorial, abstract	Presentation	Challenge and varied questions	Clear steps in learning-sequence	Marking and feedback-next steps impact	Actions since last scrutiny

We want our children to enjoy maths, and we know that children learn best when they are engaged and excited about their learning. Real-life activities support their problem-solving skills and help them see the relevance of maths in everyday life.

Below are some ideas to help you ‘think outside the box’ when planning your maths sessions, making them as practical and active as possible:

Maths in the Outdoors:

- Use natural objects (leaves, sticks, or pebbles) for counting, grouping, or creating arrays.
- Plan a scavenger hunt with questions involving measurement (e.g., “Find something 10cm long”).
- Create obstacle courses where children need to solve problems to move to the next stage (e.g., “Solve 8×7 to unlock the next clue”).

Shopping and Money Activities:

- Set up a class shop where children calculate totals and give change using real coins or pretend money.
- Plan a "budgeting challenge" where children have to spend a fixed amount on a shopping list, deciding what they can afford.

Cooking or Baking:

- Use recipes to practice measurements, scaling up or down, and converting between units (e.g., grams to kilograms).
- Challenge children to divide portions or fractions of ingredients.

Games and Challenges:

- Play “Maths Escape Rooms” with problem-solving tasks leading to a “locked treasure.”
- Use dice games to practice addition, multiplication, or probability.
- Plan relay races where teams solve problems to progress through the course.

Real-Life Data Handling:

- Conduct a class survey (e.g., favourite fruit or sport) and create graphs to represent the data.

- Measure temperatures over a week and calculate averages or compare with another location.

Creative Construction Projects:

- Provide building blocks or LEGO to create 3D shapes, exploring volume and surface area.
- Use paper folding (origami) to explore geometry and symmetry.

Time and Measurement Activities:

- Organise a “time challenge” where children calculate durations of events or schedules.
- Create measuring stations for height, length, or weight using rulers, scales, or tape measures.

Problem Solving through Role Play:

- Create scenarios like planning a party, designing a garden, or building a theme park, where children calculate costs, areas, or quantities.
- Run a pretend “travel agency” where children calculate distances, travel times, and costs.
- By incorporating these engaging and hands-on ideas, we can inspire children to develop a love for maths while strengthening their problem-solving and critical-thinking skills.

Cross-Curricular Maths

Some of your topics throughout the year will provide lots of opportunities to explore and teach real life mathematics.

Examples of cross-curricular maths

- History – Timelines, finding the difference between dates/ periods of time, Roman Numerals, time, money
- Geography – scales, population, shape, data handling, money, co-ordinates
- Science – Measurement, data handling, weight
- PE – Time, measurement, estimation, data handling, counting
- Art – Shape, area and perimeter, angles

Math Challenges for Children at Home

1. Purple Mash Activities:

Purple Mash offers a variety of interactive math activities that can help children practice different concepts.

2. Math Challenges Through Everyday Activities:

These activities integrate math into daily life, helping children see the practical applications of numbers:

- Shopping and Budgeting: Challenge children to create shopping lists, estimate costs, and calculate change. They can practice addition, subtraction, and money management.
- Counting Cars: Ask children to count cars of different colours parked outside, helping them practice counting and categorising.
- Time Management: Encourage children to set a timer for daily tasks or organise their routine by planning when to complete homework, eat meals, or play.
- Cooking and Baking: Involve them in measuring ingredients, doubling recipes, or adjusting portions for different numbers of servings. This helps with multiplication and fractions.

3. Interactive Math Games Online:

There are plenty of educational math games available online, which can be used to engage children and reinforce their learning:

- Cool Math Games: Games like “Sudoku,” “Math Bingo,” or “Number Puzzles” can be fun and educational.
- Khan Academy: Offers a wide range of lessons and practice activities suited for different levels.
- BBC Bitesize: Provides short interactive lessons and activities for various math topics.

4. Challenge Tasks with Physical Objects:

- Sorting and Categorising: Ask children to sort and group household items by size, shape, or colour. This involves logical thinking and counting.
- Building with Blocks: Use blocks to explore geometry, symmetry, and spatial reasoning.
- Measuring Objects Around the House: Have children measure various objects with.