# Anchorsholme Academy Mathematics Policy

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Adopted by Governors/HT:
Review period: Annually
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Person responsible for policy: Miss J Eckersley & Mrs C Hodgson

**Contents**

## Introduction

This policy outlines the philosophy aims, organisation and management of the teaching and learning of mathematics at Anchorsholme Academy. This policy was implemented in 2018 using the New National Curriculum (NC) programmes of study (PoS) and has been reviewed and updated annually. The most recent review was March 2024.

This policy will be updated annually.

## Philosophy

Mathematics is a global form of communication, used widely in society. The role of mathematics in day to day life and society means that it is an essential set of skills for children to develop in order to become successful, independent learners and adults. In this vein, mathematics should be studied to assist development of spatial awareness, logical order, reasoning and communication. In addition to the inherent usefulness of mathematics, it should offer students intellectual wonder, stimulation and inspiration.

## Aims

Anchorsholme Academy recognises the importance of mathematics as an individual subject and as part of the wider National Curriculum.

Our aims are to:

- Develop competence in mathematical knowledge, concepts and skills;
- Encourage our pupils to have confidence in their own ability;
- Challenge children appropriately;
- Provide opportunities for our pupils to describe, predict, interpret and explain;
- Develop our pupils' ability to recognise where mathematical skills can be applied, have the confidence to do so and solve problems;
- Encourage application of mathematics across the wider curriculum and outside of school in the wider world;
- Allow students to work independently or within groups as necessary;
- Work mathematically within and outside the classroom;
- Allow equal access to the mathematics curriculum regardless of gender, cultural or home background; and
- Ensure that children are ready to progress to the next stage of their mathematical education by the end of each year.

## Curriculum Planning

As Anchorsholme Academy is a three form entry school, our belief is that each class should have a similar starting point to ensure fair and consistent coverage of objectives.

### Long and Medium Term Planning

White Rose Maths resources are used for longer term planning as they effectively ensure coverage of the key areas of the National Curriculum and provide a guide for how to organise delivery of the curriculum. The NCETM Professional Development Planning resources, Trust Milestones and 'Ready to Progress' framework also provide staff with a range of suggestions on

using and applying mathematics in wider contexts, how to effectively connect concepts and ensure mathematical fluency for all pupils.

Short Term Planning

The White Rose Maths planning resources are the basis for all short-term planning (from Years 1-6). It is designed in line with the National Curriculum and supports a mastery approach of teaching. Where staff need further planning support, the NCETM Professional Development Planning resources and Trust Milestones can be used to provide a guideline for how to further break down objectives.

- Lessons should be structured using the principles of teaching for mastery: small progressive steps, a 'ping-pong' approach to teaching, appropriate use of representations and vocabulary and depth of understanding rather than breadth.
- Planning should consider lesson objectives, quality resources, differentiation (mastery-based), assessment opportunities and use of TA support.
- Abilities and additional needs of pupils (E.g., SEND or more able learners) should also be addressed during planning.
- Planning should be reactive: each teacher should adapt lessons and activities based on the strengths and gaps students' knowledge.
- Teachers are required to save planning resources (e.g. a smart note book) in their planning folder.
- Teachers may evaluate their plans in a format of their choice to inform future teaching, learning and interventions.
- When subject monitoring takes place, it is the responsibility of the teacher to ensure planning, resources and evaluations are available.
- EYFS mathematics plans are topic based and bespoke to our children's needs and EYFS curriculum. Plans show differentiation and progression linked to our 'EYFS Curriculum by the Sea'. White Rose Maths EYFS teaching and learning resources are also used to support and inform teaching and learning.

## Teaching of Mathematics

Organisation

- Each class has a daily mathematics lesson of 45-60 minutes – age dependent. More time may be allocated if there is a specific need.
- Lessons follow a teaching for mastery structure and have activities and representations that suit the nature of this teaching style.
- MMM will be delivered daily for 10-15 minutes. These sessions recap mathematical fluency and reasoning skills across the curriculum. They do not have to share the same objectives as the core lesson. MMM activities should be recorded and available as part of book scrutiny.
- Children in Years 1 -6 all participate in regular (usually weekly) arithmetic lessons. These are designed to help develop pupil fluency and automaticity of arithmetic skill, therefore underpinning their access to the broader mathematics curriculum.
- Opportunities are planned for application of mathematics across the wider curriculum.
- EYFS have daily access to a maths classroom which is resourced entirely for the provision of mathematics teaching. It promotes practical, hands on, fun learning activities to stimulate and engage the children. Focused maths and continuous provision activities are on offer. Continuous provision across the year group ensures that a maths-based activity will be available in all classrooms, not just the 'maths classroom'.

- Interventions are to be planned and delivered by teachers or planned by teachers and delivered by a teacher or Teaching Assistant, on the same day whenever possible.

Skill Development

Progression of skills is key for ensuring pupils are confident, fluent mathematicians. To ensure progression of skills, the following will be adhered to:

- All lessons follow the 'live marking' approach. This ensures children have opportunity to access different level of challenge and the chance to complete reasoning and problem-solving tasks in every lesson. Children receive immediate feedback and can seek early support when necessary.
- Fluency and understanding of mathematical concepts will be developed using concrete, pictorial and abstract representations of questions for pupils of all abilities. This ensures basic conceptual understanding and should allow pupils to demonstrate greater depth and mastery of skills.
- Consistent use of mathematical representations across year groups ensures connections between previous, current and future learning.
    - Example of progression from Year 1 (each counter equals 1, totaling 10 in the tens frame), to Year 4 (each counter equals 100, totaling 1000 in the frame) (DfE, 2020 p.6).

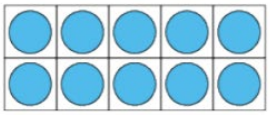

**Figure 1: using a tens frame and counters**


**Figure 2: using a tens frame and counters**

- Encouragement of use of mathematical language and sentence stems to allow pupils to ensure understanding of core concepts and begin to connect and apply their understanding.
    - For example: "5 multiplied by 6 equals thirty, therefore 5 multiplied by 60 equals 300."
- Pupils should be able to make connections between different elements of their learning as specified in the 'Ready to Progress' framework.
    - For example, understanding the commutative law of multiplication and division will support children in accessing wider areas of the maths curriculum, such as working with fractions and percentages.
- Calculations policies are in place and accessible to all (see appendices). These outline methods for developing fluency in written and mental calculations in line with the National Curriculum.
    - Children should have a grasp of number value and number sense by playing with numbers and immersion in a variety of mental and informal methods before moving onto a structured calculation method.
    - We recognise introduction of the written methods too early can be detrimental to understanding. We believe that understanding of 'why' is equal or of greater importance to 'how'.
    - The professionalism of the class teacher will determine whether a student is ready for a written method or when.
- Application of skills is a regular feature of mathematics in the classroom. Children will be required to show their mathematical reasoning orally, using diagrams or concrete resources and via written explanation.
- Group work may be used to support children of all abilities in developing all mathematical skills. This will include reasoning activities.

- Fluency of times tables recall will be a priority for all children from Year 2-6 to supplement key areas of the wider curriculum (see appendices).
- Computing and online platforms may be used to further challenge the learning, consolidate new skills and or increase speed and confidence in a specific mathematical skill.

**Learning Environment**

The classroom environment should support the teaching and learning of mathematics. This is ensured with the following measures:

- Working walls support learning and teaching of a series of lessons. They are the 'workshop' of the classroom and should be used as an independent learning tool. They may have models, representations, interactive questions and vocabulary. They can also celebrate success to motivate other learners.
- In the corridors or the classroom, a WAGOLL display may be used to demonstrate correct methodology or reasoning and inspire learners.
- Displays may also celebrate achievement – e.g. 'Times Tables Rockstars' to demonstrate and praise multiplication tables competence.

**Assessment, Reporting and Recording**

Assessment of mathematics occurs at three levels: short-term, medium-term and long-term. These assessments inform a continuous cycle of planning, teaching and assessment.

Short-Term Assessment:

- Class teachers will assess children's understanding daily/weekly through: observation, questioning, discussion and homework. This informs feedback to the students and the route of the day-to-day learning progress.
- EYFS teachers observe children's development in all aspects of maths and record evidence through the electroninc learning jounrnal 'Tapestry'; evidence logged includes photographs and developmental flags. Parents have access to their own child's learning journal. These recordings become part of the pupil profile evidence.
- KS1 and KS2 teachers' record of assessment may be made on the plan for the class, in a learning journal, record book or in another clear and accessible format.
- Children may be asked a 'Now try' question following their work to assess understanding of that day's objectives or to assess mastery of another skill taught earlier in the year.
- Questions demonstrating fluency, reasoning and problem solving are used within teaching and marking to help inform formative assessment.
- Live marking in lessons means that children are gaining in-lesson feedback every day, allowing quick response intervention and support. Teachers are not required to retrospectively mark. They can indicate FA through marking codes by the objectives: two ticks for secure understanding, one tick for partial understanding and a dot for limited understanding.
- Next step questioning can be used in marking to help review learning over the week.
- Pupils will also be taught to evaluate, peer and self-assess their achievements through whole class marking, and one-to-one feedback.

Medium & Long Term Assessments:

- The White Rose Maths End of Unit assessments are available to use as a formative assessment tool from Year 1 –Year 6.

- At the end of each half term, children from Years 2-6 complete the Star Maths assessments from Renaissance. The resulting gap analysis informs planning, teaching and intervention. It should assist teachers in planning for the start of the following curriculum year. Star Assessments are used alongside formative assessments to inform summative judgments at Christmas, Easter and Summer, creating a record of progress and attainment recorded on Arbour.
- In Year 1, summative assessment is informed by observation and formative assessment over a term. This is combined with pupil progress in weekly arithmetic activities and lesson-based reasoning and problem-solving tasks. Summative judgements for Year 1 are recorded on Arbor at Christmas, Easter and Summer.
- In Year 6, SATs data provides evidence of attainment and progress, which is recorded on Arbour.
- Year 2 classes also use regular SATs style arithmetic questions and lesson-embedded reasoning and problem-solving questions to support formative and summative assessments of pupil progress. This helps to prepare the children for their participation in the end-of-year optional KS1 SATs.
- Teachers assess and track progress of times tables knowledge and recall for pupils from Years 2-6 (Times Tables Policy: see appendices).
- In EYFS, baseline assessments are made in the Autumn term and an assessment tracker is updated each term to provide summative judgements. At the end of EYFS, children are assessed against the ELGs for Number and Numerical Pattern.
- Assessment data will be used by the mathematics subject leader to inform whole school progression and feed back to Senior Leadership.

Intervention

Teachers react swiftly to any signs of children falling behind, or data indicating underachievement. As part of mathematics lessons, a teacher or TA may work with a focus group or individual for a short time on a specific, identified area of misconception. A teacher or TA may also work with a group or individual outside of a mathematics lesson to address a specific learning gap. Whenever possible, this intervention will take place on the same day that an issue is identified.

If a TA works with a group, they should inform the teacher of any observations noted with regard to progress or particular areas of difficulty. Recording of interventions may differ across classes. This may be on the weekly plan, in a learning journal, maths books or in an intervention file. All records should be accessible for moderation if required.

## Equal Opportunities & Inclusion

In line with our Equality Policy, all members of Anchorsholme Academy are treated as individuals. We meet the needs of all pupils, regardless of gender, ability, ethnicity, culture, religion, language, sexual orientation, age, special educational needs and disability and social circumstances. In line with our British Values Policy, all staff are aware of the need for the curriculum to reflect cultural diversity, preparing pupils for life in a diverse, multi-faith society.

At Anchorsholme, all students will have equal opportunity to reach their full, realistic potential across the mathematics curriculum. We believe in supporting the children to ‘keep up, not catch up’ by careful questioning, use of resources, grouping and finally, task.

## SEND Pupils

For students with SEND, the class teacher will be required to determine the level at which the student can access. All SEND children should be supported to fully participate in all mathematics lessons. Support includes: teacher or TA support, peer support, pre-teach of vocabulary or skills, use of IT resources, differentiation of activities and practical resources. Targeted interventions, such as IDL, may also be used to help bolster confidence or close knowledge gaps.

The mastery-centred approach to delivery of maths lessons helps all pupils to develop a strong sense of the fundamentals of mathematics. Working in these small steps helps build their confidence and independence as learners. When required, SEND pupils may also be supported by use of a bespoke or differentiated curriculum in order to ensure their needs are being met in the most appropriate way possible. Any children with specific SEND in mathematics will also have targets based upon teacher assessment and skill acquisition. These are reviewed in accordance with the guidelines set out in the SEND policy.

## More-Able Learners

In order to ensure that our more able pupils are constantly working to achieve the high standards they are capable of, teachers always try to drive forward the depth of their subject knowledge. This may come through use of a range of representations or focussing on explanations of 'how you know', and being able to unpick a question to identify a problem and find a solution. In addition to this, teachers also are aware of and keep in mind the Trust Milestones from the year groups above. Whilst we endeavour to deepen subject knowledge rather than broaden it, access to the next stages of learning helps to inform planning and maintaining the high level of challenge for our more able pupils.

More able learners are also regularly provided with the opportunity to reflect upon and broaden their understanding of material within lessons via two different avenues. Firstly, the live marking approach within lessons allows the children to quickly identify any misconceptions they may have, which can then be addressed with the class teacher. This allows for quick and progressive learning. The second element used within lessons to further extend more able learner is peer-peer support. Being used as a role model and engaging in peer discussion and questioning allows pupils to access a different set of skills than those needed to complete work independently. This helps them to develop a thorough understanding of the material they are working with.

## Home Links

We recognise that parents are children's first and most enduring educators and we value highly the contribution they make. We actively encourage and support our parents in the development of their children as learners. Throughout the year, each year group will inform the parents of what topics are upcoming and any materials that they may engage with that would enhance the learning that takes place at school. This may be done through Teaching Overviews, Class Dojo/Tapestry and bi-annual Parents' Evenings. Year 6 students are actively encouraged to use CGP Mathematics and English notes. We operate an open-door policy and the subject leader is available for 'drop-ins' to assist with any parental concerns or questions regarding mathematics.

**Homework**

Mathematics homework is provided on a regular basis. However, for specific groups of children, daily practice may be required as identified by a class teacher.

Homework will be used to facilitate:

- Practice and consolidation of skills;
- Extension of skills and concepts;
- Open-ended reasoning challenges;
- Opportunity to share mathematics with the family; and
- Preparation for future learning.

**Appendix A**

White Rose Maths Planning (See Supporting Materials > Full Term Schemes)
Year 1: https://whiteroseeducation.com/resources?year=year-1-new&subject=maths#supportingmaterials
Year 2: https://whiteroseeducation.com/resources?year=year-2-new&subject=maths
Year 3: https://whiteroseeducation.com/resources?year=year-3-new&subject=maths#supportingmaterials
Year 4: https://whiteroseeducation.com/resources?year=year-4-new&subject=maths
Year 5: https://whiteroseeducation.com/resources?year=year-5-new&subject=maths
Year 6: https://whiteroseeducation.com/resources?year=year-6-new&subject=maths

**Appendix B**

White Rose Maths Calculation Policies
Addition & Subtraction: https://assets.whiteroseeducation.com/new-schemes/Addition%20and%20subtraction%20calculation%20policy%20July%202022%20v2.pdf
Multiplication & Division: https://assets.whiteroseeducation.com/new-schemes/Multiplication%20and%20Division%20calculation%20policy%20July%202022.pdf

**Appendix C**

NCETM Planning Resources
https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/

**Appendix D**

DFE 2020 Ready to Progress Framework
https://assets.publishing.service.gov.uk/media/6140b7008fa8f503ba3dc8d1/Maths_guidance_KS_1_and_2.pdf

**Appendix E**

Trust Maths Milestones

# Mathematics Progression Document

This is intended to be a spiral curriculum. Pupils should be taught National Curriculum objectives but should be supported to catch up.

| End Points (Threshold Concepts) | | Milestones | | | | | |
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| | | KS1 | | Lower KS2 | | Upper KS2 | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| **To know and use numbers** (This concept involves understanding the number system and how they are used in a wide variety of mathematics ways) | **Counting** | • **Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.**<br>• **Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens.**<br>• **Given a number, identify one more and one less**<br>• Pupils should be able to successfully respond to questions such as: Count forwards from 36, etc. Point to the third object in the line. Show me 8 cubes.<br>• Pupils should be able to give their own reasoned ideas | • **Count in steps of 2, 3, and 5 and 10 from 0, and in tens from any number, forward or backward**<br>• To be able to contextualise their understanding of number through real-life situations. E.g., use of money. | • **Count from 0 in multiples of 4, 8, 50 and 100**<br>• **Find 10 or 100 more or less than a given number**<br>• To be able to work systematically in response to a given problem. | • **Count backwards through zero to include negative numbers**<br>• **Count in multiples of 6, 7, 9, 25 and 1 000**<br>• **Find 1 000 more or less than a given number**<br>• To identify missing numbers using a number line, including negative numbers.<br>• To work out numbers in sequences, including identifying the 'rule' or pattern of the sequence. | • **Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 and negative whole numbers, including through zero**<br>• To explore numbers bigger than 1 million. E.g. Write 1 million in digits. Write down the number that is 1 more than 1 million. | • **Use negative numbers in context, and calculate intervals across zero**<br>• To use knowledge of rounding to aid estimation.<br>• To be able to perform mental calculations working with large numbers.<br>• To be able to work systematically in response to a given problem, including multi-step problems. |

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| | | on sets of numbers: E.g., 71 is the odd one out because it is not a multiple of 5. | | | | • Write down the number that is 10 more than 1 million.<br>• Write down the number that is 100 more than 1 million.<br>• To apply rules for rounding to numbers beyond Year 5 expectations. | |
| | **Representing** | **• Identify and represent numbers using objects and pictorial representations including the number line**<br>**• Read and write numbers from 1 to 20 in numerals and words.** | **• Identify, represent and estimate numbers using different representations, including the number line**<br>**• Read and write numbers to at least 100 in numerals and in words**<br>• To be able to identify and estimate missing numbers E.g., in number sentences and on number lines. | **• Identify, represent and estimate numbers using different representations**<br>**• Read and write numbers up to 1 000 in numerals and in words**<br>• To be able to partition numbers in a range of ways. | **• Identify, represent and estimate numbers using different representations**<br>**• Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.** | **• Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit** | **• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit** |

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| | | | | | • To find different ways of representing numbers using concrete resources, pictorial representations and abstract notation.<br>• To be able to use roman numerals to represent numbers | | |
| | **Comparing** | • **Use the language of: equal to, more than, less than (fewer), most, least**<br><br>• Pupils should be able to compare amounts | • **Compare and order numbers from 0 up to 100; use <, > and = signs**<br>• Be able to identify greater than/less than relationships, including use of <> symbols. | • **Compare and order numbers up to 1 000**<br>• To use mathematical reasoning to explain logical answers to questions | • **Order and compare numbers beyond 1 000**<br><br>• To use mathematical reasoning to explain logical answers to questions | • **Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit**<br>• To use mathematical reasoning to explain logical answers to questions | • **Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit**<br><br>• To use mathematical reasoning to explain logical answers to questions |

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| | **Place value** | • To use practical resources to represent 2 digit numbers. | • **Recognise the place value of each digit in a two-digit number (tens, ones)**<br>• **To use practical resources to deepen understanding of place value.** | • **Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)**<br>• To use practical resources to deepen understanding of place value. | • **Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)**<br>• round any number to the nearest 10, 100 or 1 000<br>• To use practical resources to deepen understanding of place value. | • **Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit**<br>• round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000<br>• To use practical resources to deepen understanding of place value. | • **Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.**<br>• **round any whole number to a required degree of accuracy**<br>• To use practical resources to deepen understanding of place value. |

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| | **Solving problems** | | **• Use place value and number facts to solve problems** | **• Solve number problems and practical problems involving these ideas.** | **• Solve number and practical problems that involve all of the above and with increasingly large positive numbers** | **• Solve number problems and practical problems that involve all of the above**<br><br>• To be able to work systematically in response to a given problem, including multi-step problems. | **• Solve number and practical problems that involve all of the above**<br><br>• To be able to work systematically in response to a given problem, including multi-step problems. |
| **Add and subtract**<br>(This concept involves understanding both the concepts and processes of addition and subtraction) | **Complexity** | **• Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs**<br>**• Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as: 7 = - 9** | **• Applying their increasing knowledge of mental and written methods.**<br><br>• Compare number sentences | **• Solve addition and subtraction one-step problems in contexts, deciding which operations and methods to use and why.** | **• Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.** | **• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why** | **• Use their knowledge of the order of operations to carry out calculations involving the four operations** |

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| | | • Compare number sentences | | | | | |
| | **Methods** | **• Add and subtract one-digit and two-digit numbers to 20, including zero**<br>**• Add by counting on.**<br>**• Subtract by counting back.**<br>**• Add ones using number bonds** | **• Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:**<br>**♣ a two-digit number and ones**<br>**♣ a two-digit number and tens**<br>**♣ two two-digit numbers**<br>**♣ adding three one-digit numbers**<br><br>**• show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot** | **• Pupils should be taught to:**<br>**♣ add and subtract numbers mentally, including:**<br>**♣ a three-digit number and ones**<br>**♣ a three-digit number and tens**<br>**♣ a three-digit number and hundreds**<br><br>**• Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction** | **• Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate** | **• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)**<br>**• Add and subtract numbers mentally with increasingly large numbers** | |

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| | | | **add and subtract numbers using concrete objects, pictorial representations, and mentally, including:**<br>*** a two-digit number and ones**<br>*** a two-digit number and tens**<br>*** two two-digit numbers**<br>*** adding three one-digit numbers** | | | | |
| | **Checking** | **• Represent the calculation pictorially to prove the answer.** | **• Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.** | **• Estimate the answer to a calculation and use inverse operations to check answers** | **• Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy** | **• Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.** | • Represent the calculation pictorially to prove the answer. |

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| | **Using number facts** | **• Represent and use number bonds and related subtraction facts within 20** | **• Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100** | **• Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.** | **• Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.** | | • Add and subtract negative integers<br>• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why |
| **Multiply and divide**<br>(This concept involves understanding both the concepts and processes of multiplication and division) | **Complexity** | **• Solve problems involving multiplying and dividing, using concrete objects and pictorial representations** | **• Solve problems involving multiplying and dividing, using materials, arrays, repeated addition** | **• Solve problems involving multiplying and dividing, including, using the distributive law to multiply two digit numbers by one digit** | **• Solve problems involving missing numbers, including integer scaling problems and harder correspondence problems (such as n objects are connected to m objects)** | **• Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.** | **• Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.** |
| | **Methods** | **• Group amounts using arrays to calculate the total Understand the concept of 'lots of'** | **• Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication** | **• Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including** | **• Multiply two-digit and three-digit numbers by a one-digit number using formal written layout** | **• Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication** | **• Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication** |

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| | | | **(×), division (÷) and equals (=) signs** | **for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)** | | **for two-digit numbers** | |
| | **Checking** | | **• Use known multiplication facts to check the accuracy of calculations** | **• Use known multiplication facts to check the accuracy of calculations** | **• Estimate and use inverse operations to check answers to a calculation** | | **• Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy** |
| | **Using multiplication and division facts** | **• Count in multiples of twos, fives and tens**<br>**•The *number* of coins in a set is different from the *value* of the coins in a set; knowledge of counting in groups of two, five or ten can be used to work out the value of a** | **• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers**<br>• Explore the relationship between 5 and 10. | **• Recall and use multiplicatio n and division facts for the 3, 4 and 8 multiplicatio n tables.**<br>• Explore the relationship between 4 and 8. | **• Recall multiplication and division facts for multiplication tables up to 12 × 12**<br>• Explore times table patterns including generalising about the product in terms of odd/even factors, reviewing divisibility rules, and exploring | • Identify common factors, common multiples and prime numbers.<br>• Establish whether a number up to 100 is prime and recall prime numbers up to 19.<br><br>**• Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.** | Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3).<br><br>Solve problems involving multiplication and division including using knowledge of factors and multiples, squares and cubes<br><br>• Use knowledge of order of operations to carry |

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| | | **set of identical low-denominatio n coins.** | | | square numbers. | | out calculations involving the four operation |
| **Fractions** (This concept involves understanding the concept of part and whole and the ways of calculating using it) | **Counting in fractional steps** | **• Pupils should count in fractions up to 10, starting from any number and usingthe1/2 and 2/4 equivalenceon the number line (Non Statutory Guidance)** | **• Count up and down in tenths.** | **• Count up and down in hundredths.** | **• Pupils should count in fractions up to 10, starting from any number and usingthe1/2 and 2/4 equivalenceon the number line (Non Statutory Guidance)** | **• Count up and down in tenths.** | **• Count up and down in hundredths.** |
| | **Recognising fractions** | **• Recognise, find and name a half as one of two equal parts of an object, shape or quantity. • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.** | **• Recognise, find, name and write fractions 1/3, ¼, 2/4, and ¾ of a length, shape, set, of objects or quantity.** | **• Recognise, find and write fractions of a discrete setof objects: unit fractions and non-unit fractions with small denominators. • Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.** | **• Recognise that hundredthsarise when dividing an object by one hundred and dividing tenths by ten.** | **• Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence).** | **• Recognise, find and name a half as one of two equalparts of an object, shape or quantity.** |

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| | | | | • Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. | | | |
| | **Decimals** | • Compare numbers with the same number of decimal places up to two decimal places.<br>• Round decimals with one decimal place to the nearest whole number. | • Read, write, order and compare numbers with up to three decimal places.<br>• Round decimals with two decimal placesto the nearest whole number and to one decimal place. | • Identify the value of each digit in numbers given to three decimal places.<br>• Solve problems which require answers to be rounded to specified degrees of accuracy | • Compare numbers with thesame number of decimal places up to two decimal places.<br>• Round decimals with one decimal place to the nearest whole number. | • Read, write, order and compare numbers with up to three decimalplaces.<br>• Round decimals with two decimal placesto the nearest whole number and to one decimal place. | • Identify the value of each digitin numbers given to three decimal places.<br>• Solve problems which require answers to be rounded to specified degrees of accuracy |
| | **Equivalence** | | • Write simple fractions e.g. ½ of 6 = 3<br>• Recognise the equivalence of 2/4 and ½ | • Recognise and show, using diagrams, equivalent fractions with small denominators. | • Recognise and show, using diagrams, families of common equivalent fractions. | • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.<br>• Read and write decimal numbers as fractions (e.g. 0.71 = 71/100) | • Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.<br>• Associate a fraction with division and calculate decimal fraction equivalents (e.g. |

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| | | | | | | **• Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.** | **0.375) for a simple fraction (e.g. 3/8).** |
| | **Addition and Subtraction of Fractions** | | | • Add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7=6 /7) | • Add and subtract fractionswith the same denominator. | • Add and subtract fractions with the same denominator and multiples of the same number.<br>• Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements, 1 as a mixed number (e.g. 2/5 + 4/5= 6/5 = 1 1/5) | • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. |
| | **Multiplication and Division of Decimals** | | | | **• Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the** | | **• Multiply one-digit numbers with up to two decimal places by whole numbers.** |

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| | | | | | **answer as ones, tenths and hundredths.** | | **• Multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places.**<br>**• Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places.**<br>**• Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^{3}/_{8}$).**<br>**• Use written division methods in cases where the answer has** |

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| | | | | | | | **up to two decimal places.** |
| | **Problem Solving** | | | **• Solve problems that involve all of the above.** | **• Solve problems involving increasingly harder fractions to calculate quantities, and fractionsto divide quantities, including non-unit fractions where the answer is a whole number.<br>• Solve simple measure and money problems involving fractions and decimals to two decimal places.** | **• Solve problems involving numbers up to three decimal places.<br>• Solve problems which require knowing percentage and decimal equivalents of ½ ¼ 1/5 2/5 4/ 5 and those with a denominator of a multiple of 10 or 25.** | |
| **Understand the properties of shapes**<br>(This concept involves recognising the names and properties of geometric shapes and angles) | **Identifying Shapes and their Properties** | **• Recognise and name common 2-D and 3-D shapes, including:<br>* 2-D shapes [e.g. rectangles (including squares), circles and triangles]<br>* 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].** | • Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line<br>• identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces | | • Identify lines of symmetry in 2-D shapes presented in different orientations<br>• Apply this understanding to halving of objects. | • Identify 3-D shapes, including cubes and other cuboids, from 2-D representations<br><br>Related to careers e.g. bricklaying.<br><br>Stacking cupboards after shopping considering shapes and space. Linked shapes. | • Recognise, describe and build simple 3-D shapes, including making nets<br>(appears also in Drawing and Constructing)<br>• Illustrate and name parts of circles, including radius, diameter and circumference and know that the |

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| | | • Recognising shapes in the environment e.g. wheels on a car.<br>• Understanding functionality of shapes e.g. round wheels. | identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]<br><br>• Using vocabulary appropriately and consistently | | | Shapes and their purpose. | diameter is twice the radius |
| | **Drawing & Constructing** | | • distinguish between regular and irregular polygons based on | • draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them<br>• Model making and construction. | • complete a simple symmetric figure with respect to a specific line of symmetry | • draw given angles, and measure them in degrees (°)<br>• Map reading – compass bearings<br>• Clocks and time | • draw 2-D shapes using given dimensions and angles<br>• Careers education e.g. bricklaying<br>• recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties)<br>• Model making and construction. Measuring areas e.g. carpet fitting. |
| | **Comparing & Classifying** | | • compare and sort common 2-D and 3-D shapes and everyday objects<br>• Understanding functionality of shapes e.g. round wheels. | | • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. | • use the properties of rectangles to deduce related facts and find missing lengths and angles | • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, |

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| | | | | | • Reading road signs, hazards and warnings | • Joinery etc. / carpet fitting<br>• reasoning about equal sides and angles | quadrilaterals, and regular polygons<br>• Understanding functionality of shapes e.g. round wheels. |
| | **Angles** | | | • Recognise angles as a property of shape or a description of a turn<br><br>Time<br><br>• Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle<br>• Recognising in the community<br>• Identify horizontal and vertical lines and pairs of perpendicular and parallel lines<br>• Recognising in the community. ICT skills e.g. underlining text | • Identify acute and obtuse angles and compare and order angles up to two right angles by size | • Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles Identify:<br>* angles at a point and one whole turn (total 360°)<br>* angles at a point on a straight line and ½ a turn (total 180°)<br>* other multiples of 90°<br>• Time, body position, positional language, taking directions, map reading, compass bearings. | • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles<br>• Recognising in the community, time, body position, positional language, taking directions, map reading, compass bearings. |

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| **Describe position, direction and movement** (This concept involves recognising various types of mathematical movements) | | • **Describe position, direction and movement, including half, quarter and three-quarter turns.** | • **Use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)**<br>• **Order and arrange combinations of mathematical objects in patterns and sequences** | | • Describe positions on a 2-D grid as coordinates in the first quadrant<br>• Plot specified points and draw sides to complete a given polygon<br>• Plot specified points and draw sides to complete a given polygon | • Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed | • Describe positions on the full coordinate grid (all four quadrants)<br>• Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. |

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| **Use measures** (This concept involves becoming familiar with a range of measures, devices used for measuring and calculations) | | **• Compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] *mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] * time [e.g. quicker, slower, earlier, later]**<br><br>**• Measure and begin to record the following:** | **• Compare and order lengths, mass, volume/capacity and record the results using >, < and =**<br>**• Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value**<br>**• Find different combinations of coins that equal the same amounts of money**<br>**• Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change**<br>**• Compare and sequence intervals of time**<br>**• Tell and write the time to five minutes, including quarter** | **• Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)**<br>**• Measure the perimeter of simple 2-D shapes**<br>**• add and subtract amounts of money to give change, using both £ and p in practical contexts**<br>**• Tell and write the time from an analogue clock, including using**<br>• Roman numerals from I to XII, and 12-hour and 24-hour clocks<br><br>**• Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of** | **• Convert between different units of measure [for example, kilometre to metre; hour to minute]**<br>**• Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres**<br>**• Find the area of rectilinear shapes by counting squares**<br>**• Estimate, compare and calculate different measures, including money in pounds and pence Mathematics – key stages 1 and 2 28 Statutory requirements**<br>**• Read, write and convert time between analogue and** | **• Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)**<br>**• Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints**<br>**• Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres**<br>**• Calculate and compare the area of** | **• Compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] *mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] * time [e.g. quicker, slower, earlier, later]** |

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| | | ♣ lengths and heights<br>♣ mass/weight<br>♣ capacity and volume<br>♣ time (hours, minutes, seconds)<br><br>• Sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening<br><br>• Recognise and know the value of different denominations of coins and notes<br><br>• Recognise and use language relating to dates, including | past/to the hour and draw the hands on a clock face to show these times<br>• Know the number of minutes in an hour and the number of hours in a day | seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight<br>• Know the number of seconds in a minute and the number of days in each month, year and leap year<br>• Compare durations of events [for example to calculate the time taken by particular events or tasks]. | digital 12- and 24-hour clocks<br>• Solve problems involving converting | rectangles (including squares), and including using standard units, square centimetres (cm2 ) and square metres (m2 ) and estimate the area of irregular shapes<br>• Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]<br>• Solve problems involving converting between units of time<br>• Use all four operations to solve problems involving measure [for example, length, mass, | • Measure and begin to record the following:<br>♣ lengths and heights<br>♣ mass/weight<br>♣ capacity and volume<br>♣ time (hours, minutes, seconds)<br><br>• Sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening<br>• Recognise and know the value of different denominations of coins and notes<br>• Recognise and use language |

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| | | **days of the week, weeks, months and years**<br>**♣ Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.** | | | | **volume, money] using decimal notation, including scaling.** | **relating to dates, including days of the week, weeks, months and years**<br>**♣ Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.** |
| **Use statistics**<br>(This concept involves interpreting, manipulating and presenting data in various ways) | **Interpreting, constructing and presenting data** | | • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables<br>• ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity<br>• ask and answer questions about totalling and comparing categorical data | • Interpret and present data using bar charts, pictograms and tables<br>• Solve one-step and twostep questions 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables | • Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs<br>• Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. | • **Complete, read and interpret information in tables, including timetables**<br>• Solve comparison, sum and difference problems using information presented in a line graph | • Interpret and construct pie charts and line graphs and use these to solve problems<br>• Calculate and interpret the mean as an average |

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| | **Solving Problems** | • solve one-step and two step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables. | • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. | • solve comparison, sum and difference problems using information presented in a line graph | • calculate and interpret the mean as an average | • solve one-step and two step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables. | • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. |
| **Use algebra** (This concept involves recognising mathematical properties and relationships using symbolic representations) | **Equations** | **• solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 =. - 9**<br><br>(copied from Addition and Subtraction)<br><br>*represent and use number bonds and related subtraction facts within 20* (copied from Addition and Subtraction) | **• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems. (copied from Addition and Subtraction)**<br><br>*(recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100* (copied from Addition and Subtraction) | **• solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction)**<br><br>*(solve problems, including missing number problems, involving multiplication and division, including integer scaling* (copied from Multiplication and Division) | | | • use the properties of rectangles to deduce related facts and find missing lengths and angles (copied from Geometry: Properties of Shapes)<br>find pairs of numbers that satisfy number sentences involving two unknowns |

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| | **Formuale** | | | | • Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit. (Copied from NSG measurement) | | • use simple formulae<br>• recognise when it is possible to use **formulae** for area and volume of shapes (copied from Measurement) |
| | **Sequences** | **• sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening (copied from Measurement)** | **• compare and sequence intervals of time (copied from Measurement)** | | | | • generate and describe linear number sequences |

**A good mathematician will have:**

- An understanding of the important concepts and an ability to make connections within mathematics.
- A broad range of skills in using and applying mathematics.
- Fluent knowledge and recall of number facts and the number system.
- The ability to show initiative in solving problems in a wide range of contexts, including the new or unusual.
- The ability to think independently and to persevere when faced with challenges, showing a confidence of success.
- The ability to embrace the value of learning from mistakes and false starts.

- The ability to reason, generalise and make sense of solutions.
- Fluency in performing written and mental calculations and mathematical techniques.
- A wide range of mathematical vocabulary.
- A commitment to and passion for the subject.

National Curriculum National Curriculum Expectations

Above and beyond the national curriculum

Steps to National Curriculum

**Cultural Capital**

**Appendix E (1)**
**EYFS Trust Maths Milestones**

## Educational Programme for Mathematics

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

| Number ELG | Numerical Patterns ELG |
|---|---|
| Children at the expected level of development will:<br>- Have a deep understanding of number to 10, including the composition of each number;<br>- Subitise (recognise quantities without counting) up to 5;<br>- Automatically recall (without reference to rhymes, counting or other aides) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. | Children at the expected level of development will:<br>- Verbally count beyond 20, recognising the pattern of the counting system;<br>- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;<br>- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally. |

# Numerical Patterns Milestones

### *Rote Counting*

- *Rote count from 1.*
- *Rote count on from a given number between 1 and 20.*
- *Rote count back from 5 to 1 then from 10 to 1.*
- *Rote count back from a given number between 1 and 20.*
- *Know what number comes before, or after a given number.*
- *Say a number between two given numbers.*
- *Rote count beyond 20.*

### *Recognition*

- *Recognise and identify numerals 0 to 20.*
- *Select the numeral that represents a set of objects.*
- *Order numerals 0 to 20.*

### *Counting Items*

- *Understand that counting is to find out how many.*
- *Use one to one correspondence when counting.*
- *Understand the last number said is the number in the set.*
- *Count up to 20 objects, pictures, sounds and actions.*
- *Understand and use conservation of number.*
- *Use the word 'zero' to represent 'none'.*
- *Compare two sets of different objects saying which set is more, greater, fewer, less, same, equal.*
- *Order three or more sets of objects.*
- *State without counting (subitise) quantities within 5.*
- *Make a sensible guess of quantities within 10.*

### *Sense*

- *Partition a set of objects in different ways using the terminology part - part – whole.*
- *Explore the patterns in odd and even numbers.*
- *Understand that 'teen' numbers are a group of 10 plus another number.*
- *Understand 20 is the same as two groups of 10.*
- *Recognise repeating patterns in the counting sequence i.e. 6, 7, 8, 9; 16, 17, 18, 19; 26, 27, 28, 29.*

### *Ordinal Numbers*

- *Understand and use ordinal numbers.*

### *Fractions*

- *Understand that sharing is splitting an amount into equal parts.*
- *Understand that halving is sharing into two equal parts.*
- *Understand that doubling is adding the same number to itself.*
- *Automatically recall double facts to 10.*

### *Graphics*

- *Represent amounts in their own ways.*
- *Represent their thinking in their own ways.*
- *Talk about their representations.*
- *Write numerals 0-9, 10-20.*

### *Calculating*

- *Understand the concept of addition by practically combining sets of objects to find how many and use the terminology part – part – whole.*
- *Understand the concept of subtraction by practically removing one amount from within another to find how many are left and use the terminology part – part – whole.*
- *Relate subtraction to addition in practical situations using the terminology part – part – whole.*
- *Identify one more and one less than a given number.*
- *Identify two more and two less than a given number.*
- *Add two single-digit numbers totalling up to 10, using practical equipment.*
- *Add two single-digit numbers totalling greater than 10, using practical equipment.*
- *Subtract a single-digit number from a number up to 10, using practical equipment.*
- *Subtract a single-digit number from a number greater than 10, using practical equipment.*
- *Automatically recall addition and subtraction facts up to 5 and some addition and subtraction facts to 10.*

### *Vocabulary*

- *Number, order, count, pattern, next, forwards, backwards.*
- *More, less, fewer, altogether, equals, the same as, how many, too many, lots of, not enough, fewer than, before, after.*
- *Zero, one, two, three…*

# Space, Shape and Measure Milestones

## Shape and Space

### Shape

- *Use everyday language to talk about shapes in the environment.*
- *Build and make models with 3D shapes.*
- *Create patterns and pictures with 2D shapes.*
- *Name common 2D shapes (circle, triangle, square, rectangle, oblong).*
- *Name common 3D shapes (sphere, cube, cuboid, cone).*
- *Talk about using mathematical language (straight, curved, sides, flat, solid).*
- *Sort shapes according to their own criteria.*
- *Know that shapes can appear in different ways and be different sizes.*

### Space

- *Understand and use positional language in everyday situations.*
- *Understand and use ordinal numbers when describing position.*
- *Understand and use the language of movement/direction.*
- *Recognise patterns made of objects, numbers and shapes.*
- *Describe patterns made of objects, numbers and shapes.*
- *Create and describe their own patterns made of objects, numbers and shapes.*

## Measurement

### Distance

- *Understand that measures of distance can have different names including length, width, height.*
- *Compare two objects of different length.*
- *Compare two objects of different width.*
- *Compare two objects of different height.*
- *Understand and use language of comparison, (e.g. wider/narrower; longer/shorter; taller/shorter).*
- *Order three objects of different length/width/ height.*
- *Understand and use language of comparison between three objects, (e.g. widest/narrowest; longest/shortest; tallest/shortest).*
- *Find an object of similar length, width, height. Understand the concept of the conservation of length, width, height.*
- *Use uniform non-standard units to measure length, width, height.*

### Weight

- *Understand the measurement of weight(heavy/light).*
- *Compare two objects of different weights.*
- *Understand and use language of comparison, (e.g. heavier/lighter).*
- *Understand the concept of conservation of weight.*
- *Use uniform non-standard units to measure weight.*

### Volume/Capacity

- *Understand the measurement of volume/capacity (empty/nearly full).*
- *Compare two of the same container holding different amounts.*
- *Understand and use language of comparison, (e.g. empty/full, more/ less, most/least).*
- *Order three of the same container holding different amounts.*
- *Understand and use the language of comparison of three of the same container holding different amounts (e.g. most/least).*
- *Understand the concept of conservation of volume/capacity.*
- *Use uniform non-standard units to measure volume/capacity.*

### Money

- *Understand that we need to pay for goods.*
- *Talk about things they want to spend their money on.*
- *Talk about different ways we can pay for things.*
- *Recognise that there are different coins.*
- *Recognise 1p coin.*
- *Use 1p coins to pay for items.*

### Time

- *Talk about significant times of the day, (e.g. home time, lunch time snack time, bed time, etc).*
- *Use the language of comparison when talking about time, (e.g. longer/shorter; faster/slower).*
- *Understand and use language (e.g. before, after, yesterday, today, tomorrow).*
- *Sequence two or three familiar events and describe the sequence.*
- *Know the names of the days of the week.*
- *Say names of days of the week in order.*

**Appendix F**

Times Tables Policy

Introduction

This policy outlines the aims, organisation and management of the teaching and learning of times tables at Anchorsholme Academy. It has been based on the New National Curriculum (NC) and supplementary materials from the NCETM, Third Space Learning and Times Tables Rock Stars.

Philosophy

Times tables are a fundamental element of a well-rounded mathematics curriculum. Rapid recall of times tables allows children to access and assimilate new learning more quickly, and should also encourage confidence and independence during problem solving and real-life situations.

As the National Curriculum requires children to rapidly recall times table (and associated division) facts up to and including 12 x 12, the following document outlines the ways we aim to ensure children are able to achieve age related expectation in the Year 4 Multiplication Tables Check. Subsequently, children should enter Upper Key Stage Two without poorer times tables knowledge limiting their progress.

Aims

- To systematically develop children's knowledge and fluency of times tables facts.
- To teach the children strategies to help learn and recall their times tables out of order, rather than simply knowing a string of 'meaningless' numbers.
- To ensure the children understand the commutative law of times tables. For example, 4 x 8 is the same as 8 x 4.
- To ensure children have good knowledge of the division facts related to times tables, and that they understand the inverse relationship of multiplication and division.
- To give meaning to the learning of times tables by allowing the children to understand their wider application.
- For children to be more confident mathematicians as the result of strong times tables knowledge supporting new learning.

Teaching of Times Tables

Organisation

- The whole class teaching of times tables should be completed a minimum of three times per week, using the times tables booklets provided by the NCETM. Teaching must use the guidelines set out below. This begins in Spring Term of Year 2.
    - Whole class focus times table is recorded on the working wall, with new facts indicated.
        - The focus times table should always be the second multiplicand in the calculation.
          **Example**
          8 x 4 = 32  4 is the focus times table.
    - Children complete a two-minute times tables test (using the display as support)
    - This is marked as a class
        - Children will be encouraged to use the same verbal pattern when answering each question e.g. 'Seven sixes are forty-two.'
        - This is also applied for division calculations

**Example**

18 / 3 = 6 would be marked stating 'Three sixes are eighteen.'

- Children should be aiming to better their own score each test.

- Children should have regular weekly access to independent times tables practice in school. This can be completed through:
  - TTRS (2-3 x pw using class computer/iPad):
    - Garage set from teacher assessment to teach knowledge gaps.
    - Studio to review and recap all times tables up to 12 x 12
    - Soundcheck for Year 3 & 4 children to practice the MTC.
  - There are also various activities on Top Marks: https://www.topmarks.co.uk/maths-games/7-11-years/times-tables
  - Times tables songs can be used on Youtube
  - For UKS2, speed tables grids may be used to practice times tables for fluent children.
    - Those who still need support should receive intervention.

- Interventions and precision teaching should be established for those children who need extra support.

Assessment, Reporting and Recording

Weekly Assessment

Providing the minimum requirements are being met, weekly assessment should be easy to collate:

- Times tables booklets/tests should be marked and scores collated each week to view pupil progress.
  - This could be in booklets, maths books or designated times tables books.
- For UKS2, speed tables grids can be filed or glued into maths books.
- TTRS assessment data will automatically be logged for each session.

Periodic Scheduled Assessments

The times tables tracker should be completed at the end of each half term using data from TTRS and weekly times tables assessments:

- Every half term, children should be encouraged to play 10 games on garage (minimum) on TTRS, focusing only on the times tables for their Year Group.
- Children in Year 4 will also be assessed every two weeks (minimum) using Soundcheck on TTRS. This will allow tracking specifically related to the MTC.

Data will be regularly monitored by the maths team to ensure that teaching requirements are being met and that children across school are making appropriate progress. This will be completed through monitoring the times tables tracker, TTRS access and data, drop-ins and times tables quizzes.

Intervention

At Anchorsholme Academy, the teachers react swiftly to any signs of children falling behind or data indicating underachievement at any level. As part of times tables activities, a teacher or TA may work with a focus group for a short time on a specific, identified area of misconception.

Any children receiving times tables intervention (E.g. precision teaching) should be recorded weekly by the teacher or TA responsible for the intervention.

Curriculum Map

The following curriculum maps has been designed using the New National Curriculum (NC), programme of study (PoS) and supplementary materials from the NCETM and Third Space Learning. These guidelines are recommended for whole class activities.

During independent tasks, children can be set times tables activities beyond (or behind) these outlines to allow for progress at the right rate for each child. However, during whole class activities, all children should focus on the same areas to ensure regular practice is being given to all times tables.

Year 1

Whilst Year 1 will not formally teach times tables or use the times tables booklets, in order to help pupils develop fluency and confidence as early as possible, we would like the following structure to be used within the year group.

| | |
|---|---|
| Set 1 | Count in 2s up to 24. Link this with conceptual knowledge around doubles and even numbers.<br><br>Count in 10s up to 120. |
| Set 2 | Count in 5s up to 60. Ensure this knowledge is linked with counting in 10s.<br><br>Develop fluency of counting in 2s and 10s. |
| Set 3 | Develop fluency of recall counting in 2s, 5s and 10s. |

(Third Space Learning, n.d., p. 3)

Year 2

Building on the concepts of counting in number patterns established in Year 1, formal teaching of times tables should begin in Year 2. The process for teaching and learning is outlined in the previous section of this policy.

From Spring Term in Year 2, pupils should be taught the following times tables:

| | |
|---|---|
| Set 1 | Recalling multiples of the 10 times table, up to 12 x 10, including related division facts.<br><br>Recalling multiples of the 5 times table, up to 12 x 5, including related division facts. |
| Set 2 | Recalling multiples of the 2 times table, up to 12 x 2, including related division facts.<br><br>Recalling multiples of the 3 times table, up to 12 x 3, including related division facts. |
| Set 3 | Revision of multiplication and division facts for the 10, 5, 2 and 3 times tables. |

Where pupils are identified as struggling with fluency in a particular times tables set, intervention should be delivered in timely manner.

Year 3

Building on the times tables teaching from Year 2, in Year 3, pupils should be taught the following times tables:

| | |
|---|---|
| Set 1 | Review recall of 2s, 5s and 10s knowledge (Y2 knowledge)<br><br>Recalling multiples of the 3 times table, up to 12 x 3, including related division facts.<br><br>Recalling multiples of the 6 times table, up to 12 x 6, including related division facts. |
| Set 2 | Recalling multiples of the 4 times table, up to 12 x 4, including related division facts.<br><br>Recalling multiples of the 8 times table, up to 12 x 8, including related division facts. |
| Set 3 | Revision of multiplication and division facts for the 10, 5, 2, 3, 6, 4 & 8 times tables. |

Where pupils are identified as struggling with fluency in a particular times tables set, intervention should be delivered in timely manner.

Year 4

Building on the times tables teaching from Years 2 and 3, pupils should be taught the following times tables:

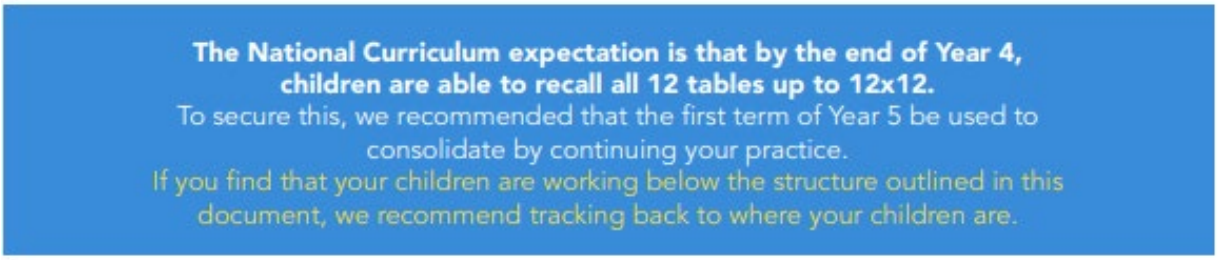
| | |
|---|---|
| Set 1 | Revision of multiplication and division facts for the 10, 5, 2, 3, 6, 4 & 8 times tables (Y3 knowledge)<br><br>Recalling multiples of the 7 times table, up to 12 x 7, including related division facts.<br><br>Recalling multiples of the 9 times table, up to 12 x 9, including related division facts.<br><br>Recalling multiples of the 11 times table, up to 12 x 11, including related division facts. |
| Set 2 | Recalling multiples of the 12 times table, up to 12 x 12, including related division facts.<br><br>Revision of multiplication and division facts for all times tables up to and including 12 x 12. |

| | |
|---|---|
| Set 3 | Revision of multiplication and division facts for all times tables up to and including 12 x 12. |

Where pupils are identified as struggling with fluency in a particular times tables set, intervention should be delivered in timely manner.

Pupils in Year 4 should also be given targeted time across the year to develop proficiency and confidence using software similar to that required for the MTC in summer.

Years 5 & 6




(Third Space Learning, n.d., p. 7)