

# Our Maths Curriculum

Newcomen Primary School

'Good mathematics is not about how many answers you know...it's about how you behave when you don't know.'



NEWCOMEN

repetitio est mater studiorum

Newcomen Primary School is committed to safeguarding and promoting the welfare of children and expects all staff, volunteers and visitors to share this commitment.

All children are provided with equal opportunities and equal access to the Maths curriculum. At Newcomen Primary, we are committed to ensuring equality of opportunity for all pupils, staff, parents and carers irrespective of race, gender, disability, belief, sexual orientation, age or socio – economic background. This document is a statement of our Intent for, and the Implementation and Impact of the teaching and learning of Maths skills and knowledge at Newcomen Primary School.

At our school, we believe that Mathematics is a tool for everyday life. It is a whole network of concepts and connections which provide a way of viewing and making sense of the world. It is used to investigate and communicate information and ideas and to tackle a range of practical tasks and real life problems. It also provides the materials and means for creating new imaginative worlds to explore and enjoy. We believe that an ability to solve problems, to reason, to think logically and to work systematically and accurately are fundamental to every child.

Maths is a core subject of the National Curriculum and a prerequisite for educational and social progress as it underpins the work in many areas of the curriculum. Our Maths curriculum is carefully sequenced to develop the acquisition of knowledge and skills in line with the National Curriculum expectations and provides opportunities for children to develop the cultural capital of the world.

Our intent is that our pupils have the essential knowledge, skills and wider understanding to be successful, independent and motivated learners in readiness for their next stage of education.

## Intent

At Newcomen Primary School, we believe that it is our duty to inspire young people to see the true beauty of mathematics by bringing maths alive making it interesting, developing deeper understanding and broadening their understanding of mathematical concepts for an ever more technical future. We aim to create a mind-set which will let each pupil believe they have the ability to do Maths reinforcing our school's motto of 'Believe Achieve Succeed'. Through our study of mathematics, our intent for our children is to do the following:

## Our Aims:

- To promote a shared love and understanding of mathematics
- To ensure an entitlement for all pupils
- To provide an ambitious curriculum as children learn best within a culture of high standards and high expectations
- To empower all children with the knowledge and facts to fulfil his/her potential

- To provide the tools and skills in order to solve everyday challenges
- To further enhance meaningful links across the curriculum deepening the knowledge and understanding of our pupils
- To promote a passion for lifelong learning
- To prepare the children for an ever changing technical world in which they will be confident and competent with their skills in maths.
- To create an inclusive culture of achievement, high standards and high expectations
- To enable all children to use vocabulary and mathematics effectively
- To ensure that all children have equal access to effective teaching and learning in all areas of a rich, broad and ambitious curriculum
- To help children develop lively, enquiring minds, the ability to question and discuss rationally and to acquire knowledge, skills and understanding relevant to a fast changing world
- To work in partnership with our Newcomen extended family - parents/carers and our immediate and wider community - for the greater benefit of all children's education.

### Through our study of Maths, our intent is for our children to:

- Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisation and developing an argument, justification or proof using mathematical language.
- Solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simple steps and persevering in seeking solutions. **We recognise and appreciate that repetition is the mother of learning – ‘repetitio est mater studiorum’.**



## Cultural Capital

With our firm belief that knowledge is transferable, our pupils are given every opportunity to participate in a wide range of learning experiences beyond their classroom. These experiences include trips to museums, theatres, adventure centres and community projects in and around Redcar and Cleveland and the North-east. Cultural Capital is the essential knowledge that children need to prepare themselves for their future success – in the world of work, in relationships forged throughout life and as a valued contributor to society. When beginning their primary school journey in the EYFS, many children arrive at school with different and sometimes more limited experiences than others. Therefore, we are determined to ensure that our children have the knowledge and skills to prepare them for any future challenges and adventures that may arise in their lives. This includes the significant vocabulary needed throughout their education and the opportunity to link maths to real-world reasoning involving length, mass, capacity, time, shape and space and coordinates.

## Early Years

Mathematics is an important part of learning for all early years children. Developing a sound understanding of mathematics when children are young is essential. Introducing maths from an early age, supports not only development in number, but also in problem solving skills, spatial awareness, patterns and shapes and measures.

All staff are passionately committed to ensuring that all children cultivate a strong grounding in number in order to develop necessary building blocks to excel mathematically in life.

We dedicate particular focus on developing spatial reasoning which supports children's mathematical outcomes. When children leave Reception, they will have an ability to think and talk about spatial concepts to feed into and develop strong mathematical skills. Alongside this, our children will gain a sound understanding in number. They will enter Year 1 as confident counters with a deep appreciation of numbers to 10.

Above all else, it is vital that children: foster positive attitudes, and interests in mathematics, look for patterns and relationships, spot connections, 'have a go' and talk to adults and peers about what they notice. We teach our children not to be afraid to make mistakes; this is how we learn. Number is taught systematically and results in children applying these skills successfully in their learning journals and in oral group activities.



Independent number and mathematics activities are skillfully planned to inspire and engage pupils within their learning areas.

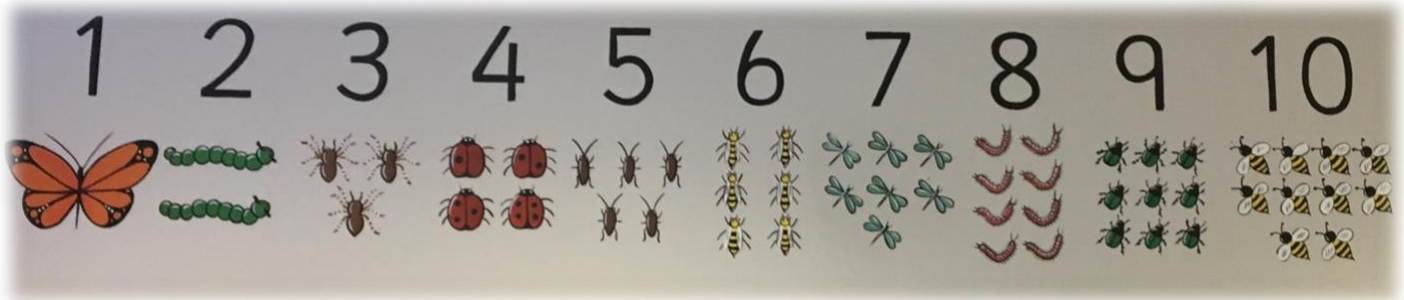
Through a practical approach, in both class based and outdoor activities, our children are encouraged to think about and practise ways of solving problems to help them to feel capable of responding to mathematical challenges. All children have an abundance of daily supported interactions and modelling by skilled practitioners.



## Repetition is the key.

Through quality planned and practical opportunities in areas of provision and role play, children are immersed in an engaging world of:

- Opportunities for a good grounding in number (subitising - the ability to recognise a number of objects in a small group without needing to count them)
- Opportunities to apply learning
- Rich mathematical vocabulary
- Spatial reasoning
- Patterns and relationships
- Shape, space and measures
- Manipulatives (Numicon, Unifix).



## Digit Formation and Presentation

It is essential that children are taught correct number formation from the beginning of their learning journey. In EYFS, children are shown how to use the '3 Dot Digit' which is enforced throughout the rest of the school. This bespoke template illustrates where every number starts and ends ensuring consistency and clarity.

From Year 1, children use books containing 1cm squares and are taught how to only write one digit in each box. This paves the way for progression with vertical calculations and place value.

Children at Newcomen are proud of the presentation of their work, which instils self-confidence and high standards throughout their Newcomen journey.



# Implementation

Though a carefully planned structure, mathematics is taught every morning at Newcomen across all year groups. Our children thrive on routine and appreciate the structure of the maths lessons, devised by the staff to ensure consistency. Previous learning is revisited and built upon daily – **repetition is the key**. Lessons follow an agreed 5 part structure throughout the school which is bespoke to Newcomen:

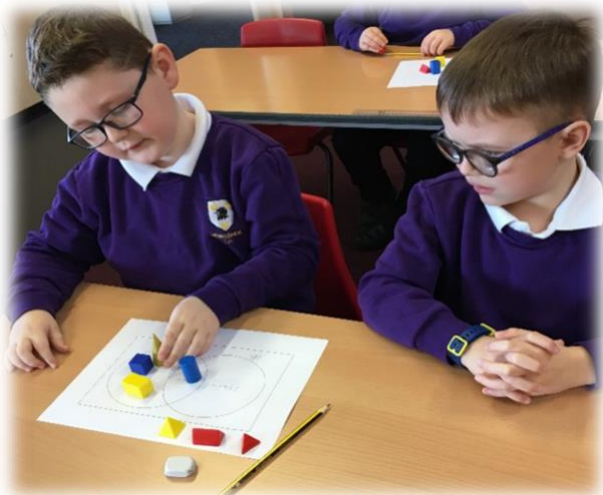
- Reinforcement of maths facts and vocabulary and their application
- Introduction of new facts/vocabulary
- Arithmetic
- AfL (Assessment for Learning)
- New learning from the following; measurement, geometry and statistics.

## Key Stage 1

The overriding emphasis of mathematics in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, vocabulary and the four operations, including using practical resources (for example, concrete objects and measuring tools).

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Effective teaching involves using a range of measures to describe and compare different quantities such as length, mass, capacity, time and money. Creative, practical sessions are vital in order for our children to make sense of the world of maths around them and to give them first hand experiences of using equipment.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. Pupils should read, spell and understand the reasoning of mathematical vocabulary at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

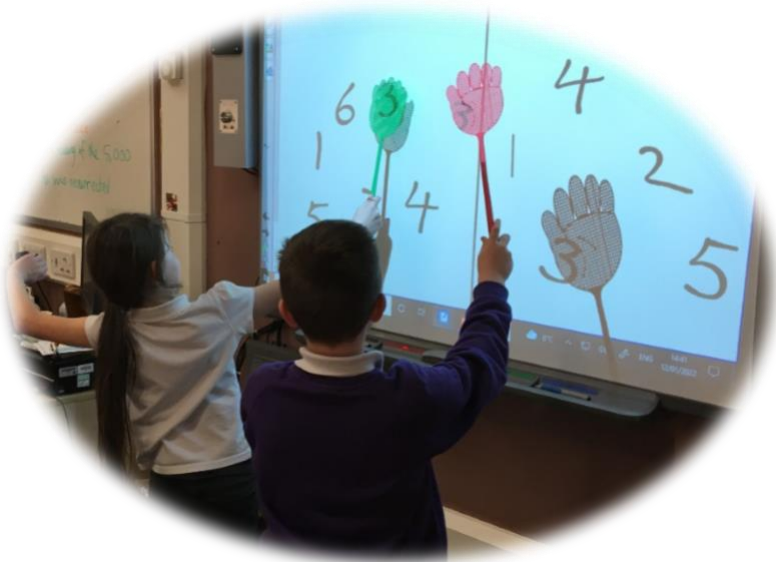


Above all, we want our young children to enjoy the beauty of maths. The immense joy it brings to see a child spot a pattern, achieve a correct calculation and suddenly realise that they can solve problems is priceless and is something which we at Newcomen all strive towards.

## Lower Key Stage 2

The key focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This ensures that pupils develop efficient written methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including simple fraction and decimal place value. Teaching ensures that pupils plot and draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties and confidently describe the relationships between them. This ensures that they can use measuring instruments with accuracy and make relevant connections between measure and number.



By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 time multiplication tables and show precision and fluency in their work. Pupils should read, spell and understand the meaning of mathematical vocabulary correctly and confidently. This knowledge is assessed by the online National Curriculum Multiplication Tables Check at the end of Year 4.

## Upper Key Stage 2

The principal intention of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This further develops the connections for pupils between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic and problems demanding efficient written and mental methods of calculations. Repeat, repeat, repeat. The skilled, strategic method of teaching reinforces children's confidence and engages them in the world of maths which is vital for their futures beyond Newcomen Primary School.

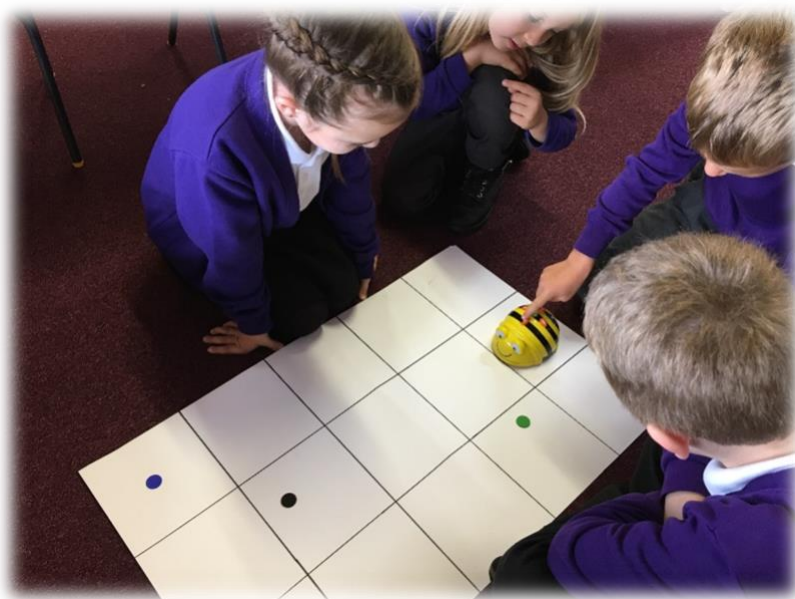
## Inclusion

Newcomen Primary School is committed to ensuring that all pupils achieve their full potential. Barriers to learning are quickly identified and the school is committed to closing any gaps in achievement. Every child is amazing and unique and within every school there will always be a number of children, who for a variety of reasons, are classed as having special educational needs or disabilities (SEND). The school identifies children with a suspected Special Education Need early so that interventions are swift and immediate.

*'Teachers' questioning skills are precisely focused to ensure that they challenge all pupils, regardless of their ability. The most able pupils are consistently pushed to deepen and extend their learning. Pupils who have special educational needs and/or disabilities are continually challenged to extend and consolidate their learning. Work in books shows that pupils do not always get it all right: this is due to the high level of challenge for all. Pupils are stretched, make mistakes and are resilient in pursuing how to correct them.'*

**OFSTED July 2016**

All children receive quality-first teaching and activities are differentiated appropriately. Every teacher at Newcomen is a teacher of every child in our school, including those with SEND. When identified pupils require additional support, proven intervention programmes, booster classes and 1-1 support are provided.



Small, focused groups are also provided for children who may require additional support within lessons. The needs of children with English as an additional language are met through targeted support in the classroom and additional 1-1 focused support.



## Pupil Voice

Pupil Voice is given high profile in school; we are extremely proud of the impact that our School Council has on school life and the ethos that we have created together. Each term, the views of children from across the school are sought to assess our children's enjoyment of mathematics. Pupil voice has been a significant factor in the policy changes for our school. For example, pupils from Key Stage 2 explained that they liked having lessons structured in a way in which there is a constant reinforcement of facts and vocabulary, arithmetic every day and essential grounding for new learning.

Pupil Voice is also evidenced within our annual Family Questionnaire where children state their proudest moments, best things about our school and anything we can do better.

*'I am proud of learning that the crocodile eats the biggest number!'*

*'When I received the Mathematician of the Week – I felt euphoric!'*

*'The Maths Knowledge Book helps me to answer lots of different questions.'*

*'I like how we revise learning frequently so it goes into your long-term memory.'*

*'My proudest moment was being able to understand algebra.'*

Our children really do appreciate the time, rigor and repetition and consolidation of learning throughout the whole school.



## Assessment, Recording and Reporting

Assessments are undertaken in line with our whole school assessment policy. Teachers use effective assessment for learning to ensure planning is based on prior attainment and that pupils know what needs to be done to achieve the next steps. Group and individual targets are discussed and set accordingly.

Throughout each lesson formative assessment takes place. Information is gathered in various ways: questioning, lesson structure (I do, we do, you do), talking to children, observing their work, live marking and use of post it notes and whiteboards. The current lesson structure promotes agile teaching so that understanding is monitored throughout each lesson.

Each term children from Year 1 and above complete a summative assessment to help them develop their testing approach and demonstrate their level of skills and understanding. Key Stage 1 and 2 use a combination of previous SATs papers and Testbase. For written maths, key facts and vocabulary, a quiz occurs fortnightly in both Key Stages. The results from both the formative and summative assessments are then used to show children's progress and attainment.

Parents are given the opportunity to discuss mathematics with their child's teacher through termly parents' evenings and annually through a written report. Reporting in mathematics will focus on each child's progress in all areas of the subject.

## Monitoring and Evaluation

Careful feedback is given to the children through marking and next steps tasks to ensure they are meeting the specific learning objective. Teachers then use this assessment to influence their planning and ensure they are providing a mathematical curriculum that will allow each child to progress and stimulate a curiosity to learn further. The teaching of maths is monitored on a termly basis through calculation book reviews, learning walks and lesson observations. By talking with the children, it becomes clear that they have a passion for numbers and relish the knowledge they gain from a systematic, planned and coherent programme. During lessons, children are all engaged and thrive on the repetition, pace and rigor of the lessons.

Maths Leaders present to our Full Governing Board our whole school provision for maths from Nursery to Year 6. This ensures our governors have a clear understanding of what maths looks like at Newcomen; they offer support and challenge where appropriate.



***'The way in which mathematics is taught is innovative. Pupils are given the tools they need to solve complex problems very quickly.'* OFSTED July 2016**

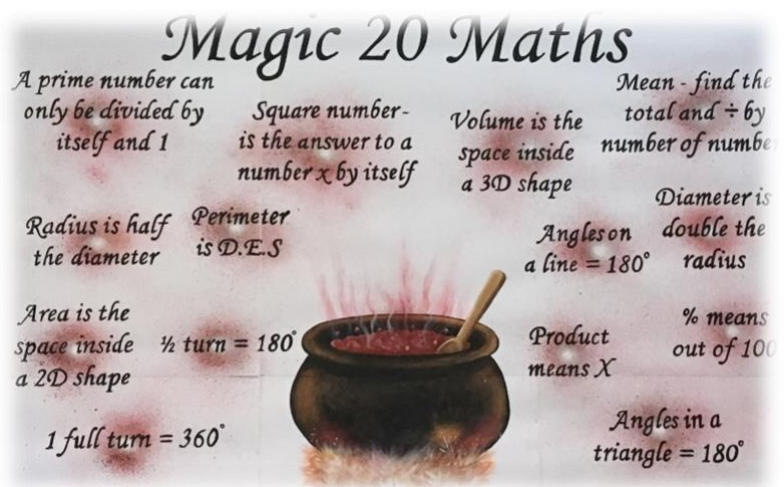
## Staff Development

All staff members keep up to date with subject knowledge and use quality resources like Testbase to support their delivery of an ambitious and stimulating curriculum. All teachers and support staff attend all staff training to ensure consistency. Training needs, based on

local and national initiatives, are identified, planned and delivered by the Mathematics team.

Annual subject CPD, devoted entirely to mathematics at the start of each academic year and a review of the previous year, is undertaken. This both celebrates the previous year's success and gives the foundations to further build upon.

The mathematics team have worked together to create a bespoke Progression in Calculations Policy which ensures that staff have clear examples of how to teach the four operations, both within their particular year group and across the key stages. This policy also details the facts and vocabulary that should be taught in each year group; thus giving a continuity with clear progression throughout the key stages.



*'The **teaching of mathematics is inspirational**, which is leading to outstanding progress being made by all. The innovative development of 'Magic 12' and 'Magic 20', which prompt pupils to recall facts at a rapid rate, is giving them the tools to carry out more complex new concepts with a greater depth of understanding. It ensures that no time is lost trying to remember key facts when new subjects are introduced. This has resulted in many pupils working at higher levels than would be usual for their age.'*

**OFSTED July 2016**

As a National Support School, Newcomen Primary School supports the Self Improving School System and actively works with and supports other schools with staff development work and whole school improvement.

## Resources

The maths team are responsible for coordinating the purchasing of new and existing resources. From planning meetings, Phase leaders and Subject leaders prioritise what each phase needs at a particular time. The Subject Leaders are responsible for the auditing of the resources for the subject.



## Curriculum Recovery and Supporting your Child at Home

In recognition that children's learning has been impacted by school closure and disruption during the Covid 19 pandemic, the National Centre of Excellence in the Teaching of Mathematics (NCTEM) are advising a stronger focus on the key content of each year group, which relates to the following strands:

- Place value
- Number Facts
- Addition and Subtraction
- Multiplication and Division
- Fractions and Percentages (KS2)

We will continue to focus on these strands in order to consolidate arithmetic skills. Every morning from 8:30am, children practise these skills reinforcing previous knowledge and recent learning.

## Home School Partnership

All parents receive a laminated Year Group Curriculum Overview detailing information about the maths curriculum at the beginning of each academic year. This explains in detail the maths curriculum including the school's emphasis on sharing your maths facts and vocabulary at home. Parents and carers are advised of, and consulted on, the school homework timetable and policy. Dedicated staff are always willing to share methods and activities with parents. EYFS staff invite parents into school for maths workshops which illustrate how the subject is taught, dismissing any myths and apprehension around maths.

# Impact

Children will make at least good progress in Mathematics from their last point of statutory assessment. We intend that the impact of our Mathematics curriculum will ensure our pupils are academically and emotionally extremely well-prepared for life beyond primary school and throughout their exciting educational journey. By the end of KS2, almost all our pupils achieve the Expected Standard (the statutory national expectations) in Mathematics based on the National Curriculum in England, KS2 framework document 2014. We expect the number of pupils achieving at the higher score within the expected standard to be at least well above the national picture.

## Outcomes – Journey through school

Standards in the basic skills have improved dramatically over the last ten years. **By the time our pupils leave Y6, many are achieving standards well beyond what would normally be expected at their age.** It is clear pupils want to achieve and succeed. They thrive on being challenged, which results in behaviour for learning being superb.

## Key Stage 2

Key Stage 2		Reading	Writing	Maths
average progress scores in <b>reading, writing and maths</b> (National Average Progress Score = 0)	2023	8.0	3.6	6.8
	2022	6.2	4.6	6.7
	2019	7.3	4.9	5.8
	2018	3.3	6.3	8.1

average 'scaled scores' in <b>reading and maths</b>	2023	112	N/A	110
	2022	111	N/A	111
	2019	112	N/A	111
	2018	107	N/A	111

Key Stage 2		Reading	Writing	Maths	RWM Comb	National
percentage of pupils who achieved the <b>expected standard</b> or above in <b>reading, writing and maths</b>	2023	96%	82%	94%	82%	59%
	2022	100%	98%	100%	98%	59%
	2019	98%	98%	98%	98%	65%
	2018	98%	100%	98%	96%	64%
percentage of pupils who achieved the <b>higher standard</b> in <b>reading, writing and maths</b>	2023	80%	33%	53%	27%	8%
	2022	66%	30%	60%	26%	7%
	2019	65%	48%	63%	41%	10%
	2018	32%	49%	64%	23%	10%

**The performance of all pupils in all groups is significantly above that of pupils nationally. The performance of disadvantaged pupils in school is significantly above that of 'Other Pupils Nationally'.**



'Good mathematics is not about how many answers you know...it's about how you behave when you don't know'

