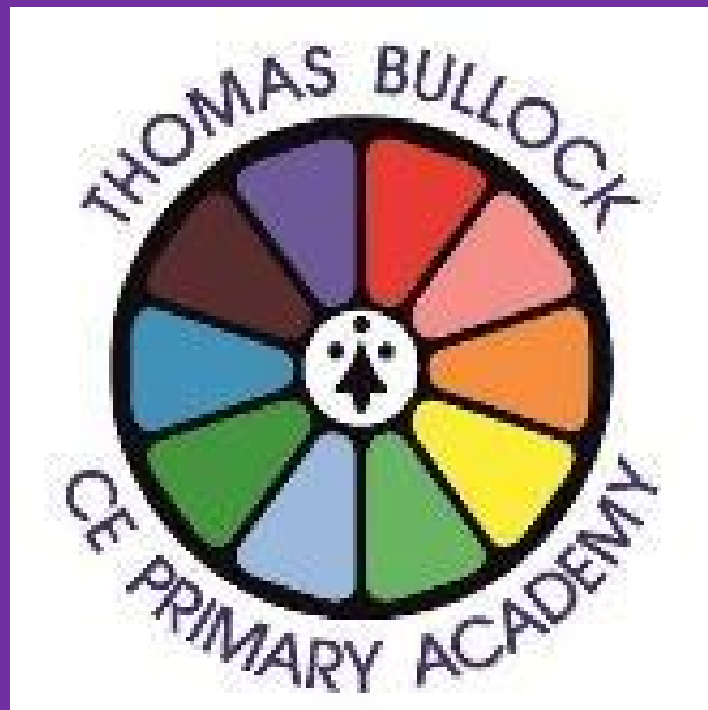


# Thomas Bullock Church of England Primary Academy

*Engage, Embrace, Care, Achieve*



## Maths Policy

2021-22

Person Responsible: Leona Newcombe  
Date Policy Reviewed- February 2022  
Date Policy Shared: February 2022  
To be Reviewed: September 2022

### **Thomas Bullock Mathematics Vision and Values**

Maths lessons are delivered as part of the curriculum offer, using White Rose to support our planning and progression. The Objectives for the lessons are underpinned by the National Curriculum. Maths lessons at Thomas Bullock are well planned and structured to ensure that new skills are learnt and imparted through effectively teaching a sequence of lessons, therefore, developing pupils' fluency, problem solving and reasoning skills. Children learn and internalise key vocabulary for their lessons and are provided with a weekly growing list, specific to their lesson, that is displayed clearly on their working walls within their classroom. Children are encouraged to challenge themselves to apply what they know to trickier problems giving them ownership of their learning and building on their resilience and confidence to achieve. Lessons are taught in an interactive way providing children with a context that makes use of the children's experiences and links with their wider learning. Children have access to TTRS to allow them to work on their Times tables from home in a fun and engaging way. We strive to engage children with a range of different experiences that transcend across cultural divides and offer pupils a rich and deep experience of understanding the power of Maths.

### **Implementation**

At Thomas Bullock our whole curriculum is shaped by our school vision which aims to enable all children, regardless of background, ability, additional needs, to flourish to become the very best version of themselves they can possibly be and to "let their light shine". Children from Reception to Y6 are given daily fluency sessions called "number ninjas" before their maths lesson to focus on mental strategies and fluency of number facts. As well as this, children are exposed to twice weekly problem solving and reasoning sessions to further enhance mathematical thinking and vocabulary. We teach the National Curriculum through the White Rose scheme supported by a clear skills and knowledge progression. This ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children.

#### **The purpose of mathematics at Thomas Bullock is to develop:**

- positive attitudes towards the subject and awareness of the relevance of mathematics in the real world
- competence and confidence in using and applying mathematical knowledge, concepts and skills
- an ability to solve problems, to reason, to think logically and to work systematically and accurately
- initiative and motivation to work both independently and in cooperation with others

- confident communication of mathematics where pupils ask and answer questions, openly share work and learn from mistakes
- an ability to use and apply mathematics across the curriculum and in real life
- an understanding of mathematics through a process of enquiry and investigation

We aim to provide a stimulating and exciting learning environment that takes account of different learning styles and uses appropriate resources to maximise teaching and learning. In each classroom there will be a 'Maths Working Wall' which key information, children's mathematical recording and ideas and key vocabulary will be added to on a week to week basis each term. As well as, a "Maths Caddie" which will provide children with various resources to support their learning.

**The aims of the National Curriculum are for our pupils to:**

- become fluent in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time
- develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately
- reason mathematically; follow a line of enquiry, conjecture relationships and generalisations
- develop an argument, justification and proof by using mathematical language. problem solve by applying knowledge to a variety of routine and non-routine problems, breaking down problems into simpler steps and persevering in answering

The National Curriculum sets out year-by-year programmes of study for Key Stages 1 and 2. This ensures continuity and progression in the teaching of mathematics.

The EYFS Statutory Framework 2014 sets standards for the learning, development and care of pupils from birth to five years old and supports an integrated approach to early learning.

This is supported by the 'Development Matters' non statutory guidance as well as the White Rose Medium Term plans for EYFS Mathematics.

The EYFS Framework in relation to mathematics aims for our pupils to:

- develop and improve their skills in counting
- understand and use numbers
- calculate simple addition and subtraction problems
- describe shapes, spaces, and measures

### **Cultural Capital links**

Cultural capital is the accumulation of knowledge, behaviours, and skills that a student can draw upon and which demonstrates their cultural awareness, knowledge and competence; it is one of the key ingredients a student will draw upon to be successful in society, their career and the world of work. Throughout their time at Thomas Bullock the children are given the opportunity to develop these skills in a variety of ways:

- Learning to read timetables
- Understanding and working out distances, proportion and scale on maps by doing orienteering activities.
- Understanding probability of events.
- Visiting local shops to put in use their skills of calculating and budgeting with money, including solving percentages for sales price, original costs and best buys.
- Learning and extending their knowledge of real-life jobs which use mathematics and the mathematicians that have had an impact on society such as Katherine Johnson, Isaac Newton, Albert Einstein etc through a maths whole school day and linking this to STEM.

### **Breadth of study**

Careful planning and preparation ensure that throughout the school pupils engage in:

- fluency in Arithmetic (Appendix 1)
- practical activities and games using a variety of resources
- problem solving to challenge thinking
- individual, paired, group and whole class learning and discussions
- purposeful practise where time is given to apply their learning
- open and closed tasks
- a range of methods of calculating (See separate calculation policy)
- working with computers as a mathematical tool

Through our creative approach to teaching and learning we also seek to explore and utilise further opportunities to use and apply mathematics across all subject areas.

## **Teachers' planning and organisation**

### **Long term planning**

The National Curriculum for Mathematics 2014, Development Matters and the Early Learning Goals (Number, Shape, Space & Measure) provide the long-term planning for mathematics taught in the school. As well as the Mathematics guidance: key stages 1 and 2 2020.

### **Medium term planning**

Years EYFS -6 use the White Rose Maths schemes of learning as their medium-term planning documents as well as the Ready-to-progress criteria and NCETM maths resources to support further.

These schemes provide teachers with exemplification for mathematics objectives and are broken down into fluency, reasoning and problem solving, key aims of the National Curriculum.

They support a mastery approach to teaching and learning and have numbers at their heart. They ensure teachers stay in the required key stage and support the ideal of depth before breadth. They support pupils working together as a whole group and provide plenty of time to build reasoning and problem-solving elements into the curriculum.

### **Short term planning**

The above schemes of learning support weekly planning and are monitored at half termly intervals by the mathematics subject leader. EYFS planning is based on the medium-term plans and delivered as appropriate to individual pupils with thought to where the pupils are now and what steps they need to take next.

All classes have daily mathematics lessons in the morning. In Key Stage 1 lessons are 45-60 minutes and in Key Stage 2 at least 60 minutes. In addition to this, Maths fluency which we call Number Ninjas is taught every day for 15 minutes with a weekly Arithmetic test to assess this (Appendix 1). As well as, pre-teaching which is used to provide children with an insight into the next week's lessons, introducing them to key vocabulary, addressing misconceptions and introducing strategies.

Teachers of the EYFS ensure the pupils learn through a mixture of adult-led activities and pupil-initiated activities both inside and outside of the classroom. Mathematics is taught through an integrated approach.

### **Special educational needs & disabilities (SEND)**

Daily mathematics lessons are inclusive to pupils with special educational needs and disabilities. Where required, pupils' IEPs incorporate suitable objectives from the National Curriculum for Mathematics or Development Matters and teachers keep these in mind when planning work. These targets may be worked upon within the lesson, in small groups as well as on a 1:1 basis outside the mathematics lesson. Mathematics focused interventions through PIXL therapies helps pupils with gaps in their learning and mathematical understanding. These are delivered by trained support staff and overseen by the SENCO and/or the class teacher.

Within the daily mathematics lesson, teachers have a responsibility to not only provide differentiated activities to support pupils with SEND but also activities that provide sufficient challenge for pupils who are high achievers. It is the teachers' responsibility to ensure that all pupils are challenged at a level appropriate to their ability.

### **Equal Opportunities**

Positive attitudes towards mathematics are encouraged, so that all pupils, regardless of race, gender, ability or special needs, including those for whom English is a second language, develop an enjoyment and confidence with mathematics. This policy is in line with the school's 'Racial Equality' policy.

The aim is to ensure that everyone makes progress and gains positively from lessons and to plan inclusive lessons. Lessons involving lots of visual, aural and kinaesthetic elements will benefit all pupils including those for whom English is an Additional Language (EAL).

Differentiated questions are used in lessons to help pupils and planned support from teaching assistants and other adults.

### **Lessons**

In all lessons, learning objectives (WALT) and success criteria (WILF) are shared with the children as well as stuck in books on labels (Appendix 3). Key vocabulary is clearly displayed on the working walls and discussed during the lesson .

The emphasis in lessons is to make teaching interactive and lively, to engage all pupils encouraging them to talk about mathematics. Lessons involve elements of:

- Instruction – giving information and structuring it well
- Demonstrating – showing, describing and modelling mathematics using appropriate resources and visual displays on the working walls
- Explaining and illustrating – giving accurate and well-paced explanations
- Questioning and discussing
- Consolidating

- Reflecting and evaluating responses – identifying mistakes and using them as positive teaching points
- Summarising – reviewing mathematics that has been taught enabling pupils to focus on next steps

All lessons will have an element of problem solving and reasoning that will be accessible for all pupils no matter their attainment level.

### **Pupils' Records of work**

Pupils are taught a variety of methods for recording their work and are encouraged and helped to use the most appropriate and convenient.

Pupils are encouraged to use mental strategies and their own jottings before resorting to more formal written methods. Pupils' own jottings to support their work is encouraged throughout all year groups.

Where tasks are practical or concrete methods are used, the class teacher or teaching assistant should take photographic evidence, which is then stuck in the child's book and annotated.

### **Marking**

Marking of pupils' work is essential to ensure they make further progress. Work is marked against success criteria, in line with the school marking policy, and includes next steps. Pupils are encouraged to self-assess their work and given time to read teachers' comments and make corrections or improvements. Responses to marking are made as close to the work as possible, ideally at the start of the next lesson. Some pieces of work in mathematics can be marked by pupils themselves, exercises involving routine practice with support and guidance from the teacher – particularly in years 5 and 6.

### **Assessment, record keeping and target setting**

Assessment is an integral part of teaching and learning and is a continuous process. Teachers make assessments of pupils daily through:

- Arithmetic assessments weekly (KS1 and 2)
- PIXL Timetables check (Appendix 2)
- Regular marking of work
- analysing errors and picking up on misconceptions
- asking questions and listening to answers
- facilitating and listening to discussions
- making observations

These ongoing assessments inform future planning and teaching. Lessons are adapted readily and short-term planning evaluated in light of these assessments.

### **Medium term Assessment**

Assessments are carried out across the school at three times during the year using the PIXL Assessments. These materials used alongside judgements made from class work support teachers in making an assessment for each pupil which in line with the assessment policy they enter onto Pupil Asset and the PIXL QLA trackers.

Teachers in years 1-6 track the detailed progress of pupils in mathematics against Pupil Asset statements and the PIXL Maths Tracker. The statements cover the mathematics objectives for the year group. This process of careful tracking adds to helping teachers form an assessment for each pupil. The PIXL tracker also helps to inform the teacher of the gaps in learning and the suitable therapy for the child to receive in order to close the gaps quickly. Pupil Progress meetings are timetabled each term for all classes. Progress of pupils is discussed and appropriate intervention considered and put in place where appropriate.

### **Long term Assessment**

In EYFS, children are measured at the end of Foundation stage against the Early Learning goals criteria for the Mathematics specific area of development and are graded as emerging, have met or exceeded the goals for number and shape, space and measure.

Years 2 and 6 complete the national tests (SATs) in May. Years 1, 3, 4 and 5 complete their final PIXL paper in term 6 which will help to accurately create a final judgement for each child in each year group.

### **Intervention**

Within every day of teaching, we will use the PiXL Assessments and effectively use the data to sharpen the focus on the key gaps in students' learning. This will then inform the implementation of specific personalised intervention for each student to enhance standards. This is achieved through, what PiXL call DTT (diagnosis, therapy and testing) a cohesive formalised AfL approach across mathematics and the whole school. Students will be provided with small group PiXL therapies to close the gaps in their learning.

### **Resources**

Each class has a stock of core resources that are age appropriate and stored in their "maths caddies". Additional mathematical equipment and resources are stored centrally in a maths unit.



### **Classroom Environment**

Teachers will ensure their classroom displays the non-negotiables for the mathematical environment (Appendix 7).

Working walls will demonstrate good examples of work (WAGOLL), key vocabulary, key questions and should display reference materials for the children that link to the objective being taught that week. Around the classroom different mathematical tools should also be displayed e.g. 100 square grid, number line, preferably positive and negative numbers, calendar, mathematical dictionary and clock. Each class will have maths caddies/ open resources available for the children to access manipulatives, to support learning where appropriate.

Engaging activities will be available in the room for extension and enrichment for fast finishers such as open ended problem solving questions.

### **Homework**

Homework for mathematics will be set by the class teacher who will decide when the homework is set and when it should be collected. Year 2, Year 5 and 6 should have regular homework to support revision for the KS1/KS2 tests.

The school has a subscription to TTRS which should be accessed by children from Y1 – Y6, at home on a weekly basis for up to 20 minutes.

### **Parental Involvement**

Parents will be invited to regular half term drop ins to look at children's work. They will also be invited to "Maths cafés" within the year to complete activities with their child.

Parents will have access to parent guides on the website to support maths at home as well as the calculation policy.

### **Role of the Mathematics Subject Leader**

- To lead in the development of mathematics throughout the school
- To monitor the planning, teaching and learning of mathematics throughout the school
- To help raise standards in mathematics
- To provide teachers with support in the teaching of mathematics
- To provide staff with CPD opportunities in relation to mathematics within the confines of the budget and the School Improvement Plan
- To monitor and maintain high quality resources
- To keep up to date with new developments in the area of mathematics

### **Conclusion**

This policy should be read in conjunction with the following school policies:

- Teaching and Learning
- Calculation Policy
- Assessment and Record Keeping
- Feedback and Marking
- Equal Opportunities
- Health and Safety
- SEND
- Computing

## Appendix 1- Arithmetic Timetable

<p><b>Fluency lessons will focus on different Arithmetic operations each week rotating through over 4 weeks and then starting at week 1 again.</b></p>					
	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<b>Week 1- Addition</b>	<b><u>Fluency practice and games</u></b>				<p><b><u>Assessment-</u></b> Each week children will be given 10 or less questions from the PIXL arithmetic questions and a further 4 questions created by the Teacher using the PIXL template related to the Maths fluency topic for that week.</p>
<b>Week 2- Subtraction</b>	<b><u>Fluency practice and games</u></b>				
<b>Week 3- Multiplication</b>	<b><u>Fluency practice and games</u></b>				
<b>Week 4- Division</b>	<b><u>Fluency practice and games</u></b>				

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
FACT FLUENCY	MATHS TALK	MENTAL STRATEGIES	STRATEGY CHECK	ARITHMETIC ASSESSMENT
<p>Games and activities linked to specific operations for the week.</p> <p>Fun fact fluency examples  <a href="https://www.scholastic.com/teachers/articles/teaching-content/7-games-practice-math-facts/">https://www.scholastic.com/teachers/articles/teaching-content/7-games-practice-math-facts/</a>  <a href="https://teachwithhollyrachel.com/whole-class-multiplication-games/">https://teachwithhollyrachel.com/whole-class-multiplication-games/</a>  <a href="https://www.prodigygame.com/main-en/blog/multiplication-games/">https://www.prodigygame.com/main-en/blog/multiplication-games/</a></p> <p>Ensure these activities are not online but something they can do physically</p>	<p>Discuss vocabulary linked to the operation</p> <p>Discussion about different calculations (specific to operation for that week)</p> <p>How would you work it out?</p> <p>Answer Free - Answer is already there, what strategies did they use ?</p> <p>Use manipulatives/ jottings/ pictures/ other formal strategies</p>	<p>What facts do we know that will help us to answer the questions? Discussion and do.</p> <p>5 questions in 5 minutes timed.</p> <p>Jottings can be used.</p> <p>Then discussion after what strategy did you use? Did anyone use a different strategy?</p> <p>Choosing the appropriate strategy - pixl therapy (could use some of these activities)</p>	<p>Discuss and use the inverse to check answers.</p> <p>Discuss use of estimation to Checking answers for reliability - PIXL therapy.</p>	<p>Focus on specific operations for that week only.</p> <p>Ensure children go back and check using strategy checks from previous lessons.</p> <p>End of Half term do an arithmetic assessment with all operations (10 questions)</p>

## Appendix 2- PIXL Times Table Planner




### PiXL Times Tables Planner



Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	Count in steps of 2, 3, 5, 10 Double and halve	Multiplication and division facts for 2 and 10	Multiplication and division facts for 5	Multiplication and division facts for 5	Summer 1A	Summer 2A
			$1 \times 5$ $4 \times 5$ $2 \times 5$ $5 \times 5$ $3 \times 5$ $6 \times 5$	$7 \times 5$ $10 \times 5$ $8 \times 5$ $11 \times 5$ $9 \times 5$ $12 \times 5$	Mixed practice multiplication and division facts for 2, 5, 10	Multiplication and division facts
			$7 \times 3$ $10 \times 3$ $8 \times 3$ $11 \times 3$ $9 \times 3$ $12 \times 3$	Summer 1B	Summer 2B	

**Appendix 3- WALT/WILF labels**

WALT	Recognise and understand the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$	
WILF	* I recognise a $\frac{1}{2}$ and a $\frac{1}{4}$ ** I understand that equivalent means <u>the same</u> . *** I understand that $\frac{1}{2}$ is equal to $\frac{2}{4}$	S I GG
C	P	A

**Appendix 4- Maths class environment non-negotiables**

1. Maths working Wall - Including key vocabulary, WAGOLL, Strategies to support learning
2. Resources readily available for children (maths caddies)
3. Number line and 100 square on wall ( age related )
4. EYFS- maths continuous provision set up inside and outside.
5. CPD on WALTs