Crossflatts' Math Curriculum

Intent

The Thrill...

Maths is a fundamental corner stone of our curriculum; it is designed to engage and captivate our children. The importance of feeling confident and fluent in maths and understanding its context and relevance to their daily lives is instilled from the beginning, in Early Years, and achieved through a variety of ways: practical investigations, real world projects, role play areas and problem solving across the curriculum. These all play a part in; igniting our children's interest and developing their mathematical fluency, problem solving and reasoning.

The Will... (Intent)

As a result of the thrill, the children's will is intrinsically motivated. All of our children are eager to acquire and build on their existing knowledge, skills and understanding so that they can know more today than they did yesterday. Our children ask questions, pose ideas, eagerly tackle a tricky problem, and recognise the power of possessing fluent maths skills, which they can apply to their lives. Our children are resilient to mistakes and persevere when the climbing becomes challenging and are unflinching when faced with multi-stepped problems.

At Crossflatts Primary School we ensure we follow the aims from the National curriculum for Mathematics to ensure that all pupils:

- Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

- Can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

The Skill...(Implementation)

Our curriculum is formed from the objectives set out in the Programmes of Study from the National Curriculum, Development Matters and the 'White Rose Maths Hub' schemes in order structure our curriculum, to ensure consistency across the academy and to support staff subject knowledge

We have a sequential, progressive and challenging curriculum, based on the White Rose mastery approach, which is sequenced intelligently to ensure new knowledge and skills are underpinned by what has been taught before, whilst guiding our children towards mastering each topic within the subject. Our

teaching staff use the White Rose Maths Hub scheme of work in conjunction with a range of high quality resources such as NRich and NCETM to support, stretch and challenge all learners within the classroom This ultimately ensures our children leave our school having gained the fluency, problem solving and reasoning skills they need to be confident and able mathematicians. Lessons may be personalised to address the individual needs and requirements for a class but coverage is maintained. In order to further develop the children's fluency, reasoning and problem-solving, we use NCETM and NRich which correlate to the White Rose lessons and further develops children's understanding of a concept and the links between maths topics.

Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

In Early Years, Mathematics involves providing children with opportunities to develop and improve their skills in the six key areas of early maths: cardinality and counting, comparison, composition, pattern, shape and space and measures. All areas of the provision have mathematical activities for the children to access as well as daily focused maths sessions.

Through each maths lesson, new content is taught through small steps to support children in their learning journey. This progresses into supported and independent practice for children to secure their new skills. Through mathematical talk, children develop the ability to articulate and discuss their thinking. We strive to ensure that children are taught to become competent mathematicians by embedding the skills and processes necessary to enable children to use and apply their Maths learning efficiently and in a variety of contexts. In order to advance individual children's maths skills in school and at home, we utilise Times Tables Rock Stars for multiplication, use low stakes assessments (Flashback 4) multiple times per week to develop fluency and ensure prior learning is embedded and practised and also teach a weekly arithmetic lesson to increase speed and recall if key mathematical facts.

Teachers use questioning to elicit feedback from all students to expose and address any misconceptions in learning. Where these misconceptions are seen, they are readdressed through supported practice to enable all children to succeed. Teachers use a range of tools to support children in knowing more and remembering more in maths. These include working walls as prompts on vocabulary displays and steps to success. Over the course of the term, children will revisit and recall previous learning to identify gaps in learning which must be planned for.

Through the assessment of multiple recall sessions per week and formal summative assessment on an end of unit and termly basis, we identify gaps which are swiftly overcome through precise teaching. Prior knowledge is also assessed before starting a new unit of work to give teachers a strong indication of any gaps in concepts and knowledge that may need addressing before starting a new unit of work and will therefore increase the chance of success for our learners.

Our children are taught to understand the relevance of maths learning to real world contexts to further their understanding of the world around them.

To be Brill (Intent)

Children at Crossflatts Primary School understand and value the importance of Mathematics, this is evident through pupil voice and monitoring which takes place every half term by the curriculum leader.

We strive to equip our children with the skills to confidently make rich connections across mathematical ideas as a result of developing fluency, mathematical reasoning and competence in solving increasingly sophisticated, contextual problems during their time at Crossflatts.

Children use their Mathematics skills as a key tool in helping them to learn, and as a result, know more, remember more and understand more.

Pupil voice, gathered by the Maths lead, will show that children talk enthusiastically about their maths lessons and speak about how they love learning about maths. They have a secure understanding of the

key strategies, methods, and vocabulary for each key area of the curriculum and can articulate the context in which maths is being taught, relating this to real life purposes. Children show confidence and believe they can learn about a new maths area and apply the knowledge and skills they already have, understanding different representations they have been exposed to.

Children have a developed understanding of the methods and skills of mathematicians at an age appropriate level.

Monitoring will show a clear progression of skills and vocabulary in line with the expectations set out in the subject progression grid. Books and lesson observations will show that pupils use acquired vocabulary in maths lessons, they have the skills to use methods independently and show resilience when tackling problems. Pupils, at an age appropriate level, are flexibly and fluently able to move between different contexts and representations. The children have a high level of pride in the presentation of their work and have a quick recall of key mathematical facts and procedures. Children are able to produce work which evidences good progress from their last point of statutory assessment and their starting points.

Through high quality first wave teaching, guidance and effective feedback, children will achieve age-related expectations by the end of each year group and some children will have progressed further to achieve greater depth.

Summative assessment takes place at the end of each term and children's progress and attainment is discussed with senior leaders in pupil progress meetings. Attainment and outcomes in mathematics have a prominent focus throughout. By the end of Key Stage Two, children will leave Crossflatts prepared for the next step in their mathematical education equipped with secure, long-term, deep and adaptable understanding of maths which they can apply in different contexts

Curriculum planning

At Crossflatts Primary School, we use the Programmes of Study set out in the National Curriculum alongside the White Rose Maths schemes to help us with the sequential planning required to deliver successful Mathematics outcomes for our children.

Our planning is set in two phases:

- Long term plans - These plans map out the Maths units that will be covered in each half term for each year group. Teachers follow the White Rose Maths Hub schemes to structure their teaching sequences to ensure that all units are covered sequentially.

  The Mathematics curriculum leader is responsible for the expectations set out in the subject progression grid to ensure progression throughout each year group.

- Medium- and short-term plans - These plans list the specific learning objectives that will be covered in each lesson.

Lesson plans – Lessons follow a clear structure based upon Rosenshein's Seven Principles of

a. Instruction - daily reviews of previously taught skills, knowledge and vocabulary acquisition through guided and independent practice.
b. Guidance and Feedback -The use of guidance and feedback is to ensure that children receive positive and constructive feedback that will move their learning and understanding forwards.
c. Learning environment -Teachers promote a stimulating and enriched learning environment where children feel safe to take risks, learn from their mistakes and understand that hard work and effort make a difference.

   In every classroom, we have a maths working wall which facilitates learning. Vocabulary and modelling of different methods are displayed on there. In order to further promote independence, staff provide resource scaffolds on the working wall so that the children can use them to support their learning. In Foundation Stage, there is a Mathematics area that is set up by the class teacher and the children decide on which resources and tasks they would like to complete.

Mathematics Resources

Each classroom will be resourced with materials to support the delivery of Maths; such items might include number lines, place value counters, dienes, multiplication tables, 100 squares, 2D and 3D shapes, multilink cubes, Numicon, dice and other smaller items. Larger materials such as scales, trundle wheels and measuring cylinders will be held centrally. Resources should be used to support the teaching and learning of new concepts to children.

Homework

KS1 and KS2: Children will be provided with half termly learn by heart facts which are specific to each year group. These will be practised and taught in class additionally. Children will also be expected to practice their times table set by their class teacher each week in order to achieve their next timestables badge. Please see timestables policy.

Reasonable Adjustments

Crossflatts Primary School recognises the importance of ensuring that children with identified Special Educational Needs and/or Disabilities have access to an ambitious mathematics curriculum. Within the curriculum area of mathematics, SEND children will be provided with reasonable adjustments through their tasks and level of challenge provided. Advice can be sought from the school's SENDCO where applicable.

We develop an inclusive curriculum through:

• Setting suitable learning challenges: It is the aim of the school that children should be given achievable learning targets, and be motivated by success. This may involve deepening children's mathematical skills and understanding, so that all children's learning needs are catered for, and pupils achieve as high a standard as possible.

• Responding to pupils' diverse learning needs: Mathematics is planned so that all pupils can take part in lessons fully and effectively so that there is an equality of opportunity through teaching approaches and planned so that potential barriers to learning and assessment for individuals and groups of pupils are overcome.

This is achieved through:

• Provision being made where necessary to support individuals or groups of pupils to enable them to participate effectively in mathematics lessons.

• Pupils' understanding being developed through the use of all available senses and experiences.

• Aspects of the Programmes of Study that may present specific difficulties for individuals being identified.

• Support to access texts (e.g. audio or larger print).

• The use of alternative communication methods e.g. ICT or speech.

In assessment, judgements allow for the provision described above.

Assessment

Children will be assessed in maths rigorously throughout the year.

• Foundation Stage make assessments which are ongoing throughout the year, including their Early Years Baseline.

• Upper Foundation Stage complete statutory Early Years Foundation Stage Profiles during Summer 1.

• In KS1 and KS2, pupils will complete maths assessments at the end of each term in addition to low stakes end of unit assessments once a topic within the subject has been taught. These will inform the next steps of learning.

• Year 2 and Year 6 will complete the statutory maths test in Summer 1, as well as similar assessments throughout the year.

• Year 4 will complete the statutory multiplication check, as well as similar assessments throughout the year.

• Teacher assessment of maths is completed using a range of evidence from maths sessions and summative assessment. Judgements are made and recorded on Target Tracker at key, agreed times.

• Timestables are assessed weekly through using the timestables badge system in place. Selected pupils in Year 6 manufacture the badges in school and distribute them as needed to each class.

The Learning Journey

Throughout the class (and year group) a progressive thread of learning – underpinned by the White Rose Mastery approach to maths - will be taught to all abilities.

This will begin with a 'Launchpad' assessment, where gaps will be identified and entry points will be defined resulting in the children being placed on a continuum of learning appropriate to the unit. Following the acquisition of the necessary fluency, ALL children will demonstrate 'mastery' of the skills via the completion of problem solving and reasoning challenges, which directly link to the real-world. Evidence of this journey will appear on working walls, under clear headings and within maths books.

The Journey/teaching sequence

1. Launchpad to assess and inform the starting points linked directly to previous learning.
2. Children are flexibly and transiently grouped, with those who need extra support being offered pre-teaching or further adult support in a lesson.
3. Teaching of skills including a demonstration including clear use of pictures, models and concrete resources to ensure a deep understanding of concepts that are transferable to abstract scenarios using the principles of the mastery approach..
4. Children will be provided with the opportunity to practise the skill independently and grapple with mistakes to ensure that we continue to build resilience and become more fluent. As per the teaching structure guidance.
5. Reasoning and problem solving challenges will then be completed to demonstrate deeper and clearer understanding, thus demonstrating secure knowledge acquisition.
6. Children will complete an end of unit assessment to inform and guide the teacher's next steps. Termly assessments will also provide teachers with feedback to help them plan for future maths teaching.
7. Work will be reviewed and revisited through multiple re-call sessions per week to enable the prior learning to 'be kept warm.'

Teaching Structure

1. Begin lessons with a short review of previous learning

Review previously learned material to strengthen the connections between pieces of knowledge. This may include terminology, flashback 4 or if this is the answer, what is the question.

2. Present new material in small steps with student practice after each step.

New material is presented in mathematics through small steps and thinking out loud, this allows the teaching to model the new learning in small chunks and allows the children to have a go in 'my turn, your turn' scenario giving time for both guided and independent practice.

3. Ask questions and check answers

To learn something, students require opportunity to practice. Teachers ask a variety of question types to develop fluency within the topic at hand..

4. Use high quality models

Children are exposed to a range of concrete examples and models throughout the learning journey.

5. Guided practice

Within mathematics, student practice is guided through a process of thinking out loud and modelling effective and efficient strategies and use of appropriate resources.

6. Check for understanding

Carefully chosen questions allow for the teacher to check for understanding and identify misconceptions. Live guidance and feedback allow staff to assess understanding and adapt feedback to ensure learners are moving their learning forwards.

7. Obtain a high success rate

Before moving on to a new topic, teacher's make sure students have mastered the current learning before moving on to the next one. Extra intervention may be required for some pupils to achieve success for a given topic.

8. Provide scaffolds for difficult tasks

Through the use of working walls, representations, cue cards and models children are provided with opportunities to overcome barriers and independently develop their skills. Staff used in classroom support capacity can provide support to some pupils in their learning and promote independent practice.

9. Independently practice

It is our expectation that children become independent in their practice and this should be used after guided practice so children become fluent and can retrieve information fluently.

10. Review prior learning

Frequent reviews of prior learning promotes children to reconsolidate newly learning information and make stronger connections within the subject.

Timestables learning

In class, children will be learning and practicing a new Timestable each half term. Here is the schedule for each year group for the upcoming year:

Children will be practicing their allotted timestable in class multiple times per week and the aim is for them to be able to deeply understand each timestable, be able to improve their recall of these number facts and apply them in their own maths.

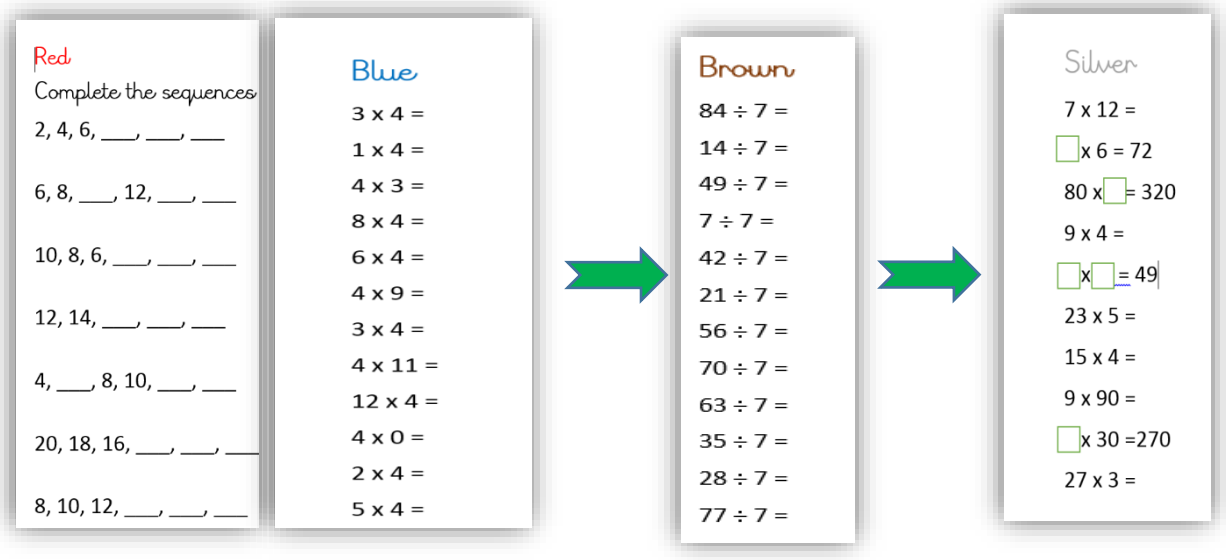
Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Experience of counting in 1s, 2s, 5s, 10s					
Year 2	1 x	(1x) 2x	5x	(5x) 10x	Revision	Revision
Year 3	(2x) 4x	(4x) 8x	3x	(3x) 6x	(6x) 12x	Revision
Year 4	(3x) 6x	(6x) 12x	(4x) 8x	9x	7x	Commutative law on all TT
Year 5	(x4) x8	x9	x7	Squares	Commutative law on all TT	Distributive law on all TT
Year 6	Commutative law on all TT	Distributive law on all TT	Squares	Cubes up to x6	Revision of all TT including DL and CL	Revision of all TT including DL and CL

Timestables badges

Children will again take part in fun and popular times tables tests arranged by their class teacher based on the new curriculum guidelines for their year group. They will be given 3 challenges to complete for each timestable. The challenge includes a number of questions to answer within a minute and when they achieve 100% on each of the three challenges for that timestable, they will receive a coloured badge – which have proved very popular in school over a number of years now.

Knowing the division fact, or inverse has proven to be extremely useful for the children, particularly as they move up through school and move onto more challenging problems, that is why we include the division challenge as part of this process. Finally, they will apply their knowledge of the timestable they are focussing on at the time with an application task and once they achieve 100% on this task they will achieve a coloured badge. .

Example 1 → Division Challenge → Application Challenge



Year Group	Times tables challenge – guideline (we appreciate that it may be different for some children)
Year 1	Red – Counting in 2's Orange – Counting in 10's Yellow – Counting in 5's
Year 2	Light green – 2 x table Green – 10 x table Light blue – 5 x table
Year 3	Blue – 3 x table Light purple – 4 x table Purple – 6 x table Pink - 8 x table
Year 4	White - 9 x table Grey - 11 x table Brown - 7 x table Black - 12 x table
Year 5 and 6	Bronze, Silver and Gold Consolidation of all the tables including the inverse.

Timestables Rockstars

All children from Year 2 upwards have been provided with a TTR account. It has proved incredibly popular app over the last year or 2 and is a wonderful tool for improving children's Timestables skills. Throughout the year, we run a series of inter class competitions to raise the profile of TTR across school.

We would strongly recommend the children to playing the game regularly at home – of course this is at the discretion of parents. The level of challenge will be set by the class teacher and can be tailored to the needs of each child.

Money Week

To enhance our children's financial capability, responsibility and knowledge, we spend a week improving our understanding of money and the impact it can have on the wider world.

During the week, children participate in a range of activities from spending in the Penny Shop in Early Years to looking at wealth inequality in Year 6.

Here is an example timetable of the week:

Money Event Crossflatts 2022

*This is a suggested timetable for the week

Year	Monday	Tuesday	Wednesday	Thursday	Friday
EYFS	What is money?	The Penny Shop	Class Shop Role play	Money Machines	Coin recognition. How much money is in my jar? Making the correct amount of money in the jars using British coins. https://www.twinkl.co.uk/resource/t-n-4814-how-much-money-is-in-my-money-jar-differentiated-worksheets
Year 1	What is money?	Ice cream shop –Different toppings cost different amounts.	Jam Jar – money bags Use real money, old £1 coins, buttons etc.	What will you do with your pocket money?	Recognising different coins
Year 2	"We're going Shopping" Buying themed items and calculating change up to 15p	Jam Jar and money bags	Needs and wants when we go shopping – "why mummy or daddy says no!"	Ice cream shop –Different toppings cost different amounts.	Buy a bike!
Year 3	Buy a bike!	Money lines – book vouchers	https://www.topmarks.co.uk/money/toy-shop-money Online activity to make up the cost of items using mixed coins.	Coins from around the world, what would it buy you here? https://www.dealchecker.co.uk/blog/2015/03/02/what-will-1-buy-you-around-the-world/ https://www.hellotravel.com/stories/top-10-things-you-can-do-with-only-100-rupees-in-pocket	Advertising – how and why do shops look like this? https://www.red17.co.uk/blog/what-are-the-benefits-of-in-store-marketing Create your own advertising for your own class shop!
Year 4	Cost of living – Guess the price activity	Buy a bike!	What are the advantages and disadvantages of shopping in large supermarkets?	Plan a holiday to Pompeii!	Saving! Someone gives you £100 – what could you do with it? Someone gives you £1000, what could you do with it?
Year 5	Keeping accounts	Plan a holiday to your favourite destination!	Saving – someone gives you £10, what would you do with it? Someone gives you £100- what would you do with it? Etc.	What is fair trade? https://www.fairtrade.org.uk/what-is-fairtrade/what-fairtrade-does/ https://www.natgeokids.com/uk/primary-resource/fair-trade-geography-primary-resource/	What is trade and how does it work? https://www.bbc.co.uk/bitesize/topics/zx72pv4/articles/zk4rmfr to gather vocabulary and understand how it works. https://www.nationalgeographic.org/activity/the-trading-game/
Year 6	Keeping accounts	How much for breakfast? Breakfast at home v breakfast in a café. Compare the cost of eating out to eating at home. Why does it cost more eating out? What other costs are included in the price of a meal at a café?	Phones! Which is the best phone deal for you? Look at different phone deals and discuss which is the best deal for you. Go on USwitch and find the best deal overall depending on what you need from a mobile contract?	Café international – pound café - using multiples of £1 and using up to date exchange rates, calculate the cost of menu prices.	Global inequalities in wealth - Presentation http://cdn.worldslargestlesson.globalgoals.org/2016/05/The-World-is-Not-Equal.-Is-That-Fair.pdf

	Research or discussion project from financial capability planning
	Teacher planned
	Financial Capability planning

Staff development

Over the course of the academic year the mathematics subject leader monitors and evaluates:

- The attainment and progress of pupils in Maths
- The pupils response and attitude to Maths
- The quality of Maths teaching in school
- The quality of children's work in Maths

This is achieved through:

- Classroom observation of Maths, including learning walks, with written feedback
- Questioning of children during these observations
- Discussions with pupils
- Carrying out regular scrutiny of work, and feeding this scrutiny back to teachers.
- Keeping all staff informed on changes that effect Maths in school.
- Attending any Maths Subject Leader training from the White Rose Maths Hub or NCETM.

• Arranging for staff to attend relevant training through White Rose Maths.

Subject development

The Maths leader will:

• Ensure the subject of Maths meets statutory requirements of the National Curriculum.

• Continue to monitor the implementation of the Maths scheme of work and progression grid.

• Continue to monitor staff development in Maths, through classroom observations if appropriate, staff questionnaires, monitoring and feeding back on observation and children's work.

• Attend appropriate courses, if available, to develop personal knowledge and expertise, and to share this in school.

• Complete pupil discussions with pupils from a range of classes, on how Maths is delivered in our school.

• Maintain the Maths section of the school website for all stakeholders.

• Monitor and evaluate the quality of Maths resources in school, and bring in new resources as appropriate.


Crossflatts
PRIMARY SCHOOL