Christ the King Catholic Voluntary Academy

Mathematics Policy

Approved by Chair of Governors	
Date of Approval	September 2025
Date of review	September 2026

Christ the King Catholic Voluntary Academy

Mathematics Policy 2025-26

1: Our Mission and Values

'Christ the King welcomes everyone in our community as we share the joys of our Faith. We worship, learn and play together in the love of Jesus, helping one another to develop the talents given to us by God.'

At Christ the King, our mission is to instil a love of mathematics in every child. We believe that all children, irrespective of gender, ability, ethnic or cultural origins, should have equal access to all parts of the curriculum, and that teaching and learning should be structured so that each child has every opportunity to realise their personal potential in mathematics.

Maths may not teach us how to add love or subtract hate, but at CTK we believe that maths gives us hope that every problem has a solution.

2: The Intent of the Mathematics Curriculum at Christ the King

Christ the King Catholic Voluntary Academy follows the National Curriculum Programmes of Study for Mathematics. Our aim is for children to make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.

When teaching mathematics at Christ the King, we intend to provide a curriculum which caters for the needs of all individuals. All children are encouraged to believe in their ability to master mathematics and are empowered to succeed through curiosity and persistence, while tackling the same concepts at the same time and progressing together as a whole class. We ensure all learners, including rapid graspers, are challenged and stretched in each and every maths lesson, encouraging resilience and an acceptance that struggle is often a necessary step in learning.

We intend for our pupils to be able to apply their mathematical knowledge across the curriculum. We want children to realise that mathematics has been developed over centuries, providing the solution to some of history's most intriguing problems. Through real life contexts and cross curricular learning opportunities, we aim to ensure pupils understand that mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment.

As our pupils progress, we intend for them to develop an appreciation of the beauty and power of mathematics in the world around us, and a sense of enjoyment and curiosity about the subject.

3: National Curriculum Programme of Study in Mathematics

At Christ the King we have created an ambitious curriculum for all pupils based on the National Curriculum Programmes of Study for Mathematics (2014). Our curriculum is coherently planned and sequenced, ensuring a clear continuity and progression which builds from unit to unit, year to year.

The overarching aims of the National Curriculum and the curriculum at Christ the King are to enable all pupils to:

- Become fluent in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time, so that pupils develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically by following a line of enquiry, conjecturing relationships and making generalisations, and developing an argument, justification and proof by using mathematical language.

- Solve problems by applying knowledge 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.

3.1: EYFS

At Christ the King, we believe that first few years of a child's life are especially important for mathematical development. Research shows that early mathematical knowledge predicts later reading ability, general education and social progress (Duncan et al, 2007). Conversely, children who start behind in mathematics tend to stay behind throughout their whole educational journey (Aubrey, Godfre, Dahl, 2006).

Therefore, our aim at Christ the King is to develop firm mathematical foundations in EYFS in a way that is engaging, and age-appropriate, based on the specific needs of our pupils.

There are six key areas of early mathematics learning in our EYFS curriculum, which collectively provide a platform for everything children will encounter as they progress through their maths learning at primary school, and beyond. The six areas of early mathematics learning are as follows:

- Cardinality and Counting
- Comparison
- Composition
- Pattern
- Shape and Space
- Measures

4: The Implementation of the Mathematics Curriculum at Christ the King

4.1: A *Teaching for Mastery* Approach

At Christ the King, teachers deliver daily maths lessons that are both creative and engaging using the NCETM Curriculum Prioritisation Materials as a basis for Long Term Planning. Please see Appendix 1 for the CTK Whole School Mathematics Long Term Plan.

Children are given time to develop a deep understanding of the mathematical concepts they are studying through unit-based learning sequences. Typically, these topic-based units last between 1 and 7 weeks. Throughout a maths unit, teachers use *Teaching for Mastery* principles which enable pupils to make connections between prior knowledge and new concepts, leading to a greater depth of understanding. Please see Appendix 2 for an example of mathematics medium term planning at Christ the King.

A wide range of mathematical resources are used when delivering the mathematics curriculum and pupils are taught to use practical equipment and pictorial representations before moving to more formal written methods.

Children not only learn about substantive knowledge in mathematics, but they can also talk confidently about the disciplinary knowledge involved and *What Good Mathematicians Do* (Appendix 3).

Typically, all children move through units of work at the same pace, studying the curriculum for their year group. Children work in mixed ability pairs/groups and all children complete the same activities. Scaffolds are provided for pupils who require additional support. Go Deeper extension questions are available for rapid graspers at each stage of every maths lesson, providing opportunities for these more confident learners to deepen their knowledge.

Rich discussion during Maths lessons enhances the children's vocabulary and ensures they become confident mathematicians who can explain both their reasoning and methodology when tackling problems.

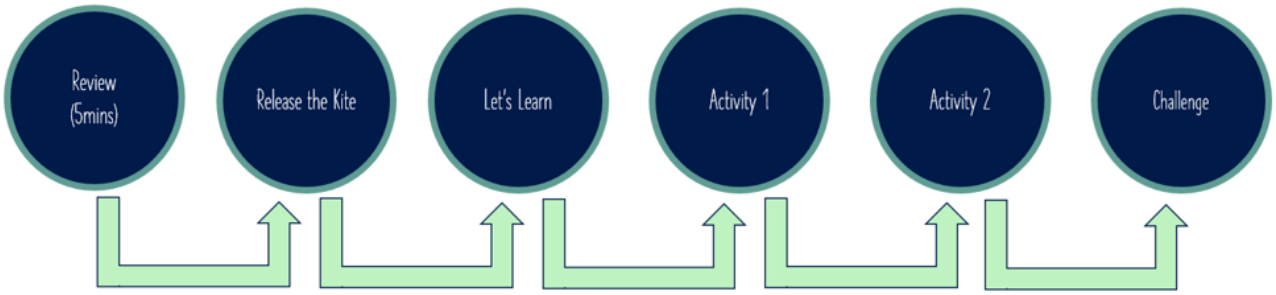
Daily *Keep Up* interventions provide additional opportunities for practice, which enable almost all pupils to move through units of work at the same pace, studying the curriculum for their year group.

Each maths unit begins with a pre-unit assessment task which informs the teachers' planning for that unit, and each unit ends with an post-unit assessment task, which enables teachers to identify any misconceptions or gaps which may need to be revisited.

4.2: The CTK Maths Lesson Structure

At Christ the King, our lesson is as detailed in Figure 1:

Figure 1:



Maths lessons at Christ the King are designed so that new material is presented in small steps with opportunities for pupils to practice after each step.

Review (3 mins)

Each lesson begins with a short review of prior learning. Pupils complete two or three carefully chosen fluency-based questions that focus on the prerequisite knowledge required for success in the new learning. These questions are designed to activate relevant knowledge, address potential misconceptions, and ensure that pupils are ready to access the next step. Children then self-mark using purple polishing pens.

Release the Kite (3 mins)

The teacher then *Releases the Kite* by sharing a problem, usually set in a real-life context, that introduces the new mathematical concept for the day. Pupils work in mixed-ability pairs for three minutes on whiteboards, after which the teacher selects examples to display under the visualiser. These are used to highlight different methods, compare efficiency, and prompt discussion. Children are often invited to the front to explain their methods and reasoning.

At Christ the King, we *Release the Kite* for each small step of learning. We believe it is important to **teach through problems rather than simply for problem solving**, so that pupils understand how the mathematics they are learning connects to the wider world and can be applied in real-life situations.

At this stage, a *Go Deeper* extension task may be introduced to stretch and deepen understanding. This task will always be linked to the *Release the Kite* question, rather than being an unrelated calculation.

I do, We do, You do (10mins)

During this part of the lesson, the teacher works through a series of carefully chosen examples on the interactive whiteboard. They think aloud, model each step, create success criteria where appropriate, and use practical or pictorial representations to support their explanations. Teachers also make explicit reference to the disciplinary knowledge required.

This phase follows the **I do, We do, You do** structure:

- **I do** – the teacher models while pupils watch.

- **We do** – the teacher and pupils work together, with pupils contributing ideas and solving examples on their whiteboards.
- **You do** – pupils complete an example independently, while the teacher checks closely for misconceptions.

At this stage, both the teacher's models and the pupil questions are deliberately very similar in nature, allowing pupils to focus on mastering the precise small step being taught without distraction. Where conceptual variation is used, the numbers remain the same while the representation or structure changes to highlight the underlying concept. Where procedural variation is used, the questions follow the same structure but the numbers change, giving pupils further practice in applying the process.

Activity 1 (10 mins)

The children then complete the independent task, consisting of 3–6 carefully designed questions that mirror the examples taught during I do, We do, You do. These questions are deliberately very similar in nature so that pupils can concentrate on consolidating the small step of learning without distraction. The design of the questions draws on the principles of conceptual and procedural variation already outlined.

Children self-mark their work using purple polishing pen, before the class discusses the answers together. This provides the opportunity for teachers to identify and address misconceptions, as well as to encourage children to notice relationships, spot patterns, and make connections in the mathematics. Teachers use probing questions such as: *What do you notice? What's the same? What's different? Which is the most efficient method and why? Can you make a generalisation?*

Teachers maintain high expectations at this stage, requiring pupils to explain their mathematical thinking in full sentences and to use accurate vocabulary. A Go Deeper extension, directly related to Activity 1, is provided to stretch and deepen understanding. This task is not simply another question of the same type, but is designed to promote deeper reasoning around the small step being taught.

Activity 2 (10-15mins) /Challenge (5-10 mins)

The teacher then models a further example, varying one aspect of the problem to increase the level of difficulty (I do/We do). Pupils then complete 3–6 similar questions independently (You do) for Activity 2.

Once pupils have finished, they move straight on to the Challenge: a low-threshold, high-ceiling task that all children can access, but which is designed to provide sufficient challenge to stretch higher-attaining pupils. These rich problems require children to apply the knowledge from that lesson alongside other mathematical concepts they have previously learned.

A Go Deeper extension, directly related to the Challenge, is also provided to promote deeper reasoning around the problem. This is not a brand-new calculation, but a task carefully designed to extend understanding of the Challenge itself.

Pupils attempt the Challenge independently or in pairs before coming together as a class to compare strategies and discuss methodology. As in Activity 1, pupils self-mark their work in purple polishing pen, and answers are discussed as a whole class.

4.3: Formative Assessment in Maths

The Maths lesson is broken into sections to deliberately provide assessment check-points for teaching staff.

As the children self-mark their work, they are provided with immediate feedback on how they are progressing and become aware for any areas for development. This self-marking also enables staff, at a glance, to provide in-lesson intervention to any pupils who require additional support.

Most lessons at CTK follow the structure of *Review, Release the Kite, I do/We do/You do, Activity 1, Activity 2, Challenge*. However, there are occasions when a concept requires more detailed explanation or the use of manipulatives to secure understanding, and in such cases only one activity may be used. Equally, some small steps are best broken down further, and teachers may judge it appropriate to include three activities.

Challenges are used in most small steps of learning; however, it is not essential they are used for every small step. Teachers use their discretion on which small steps lend themselves best to the low threshold, high ceiling activities.

4.4: Mathematical Language and Vocabulary

Having high expectations for vocabulary is a whole-school expectation at Christ the King, and Maths is no exception. Mathematical vocabulary is explicitly identified in the medium-term planning documentation and must be used accurately to support the development of children's knowledge and understanding.

Stem sentences are used consistently across all year groups to scaffold pupils' explanations and to embed correct terminology. Teachers model precise mathematical language in their lessons and encourage children to use the same language to articulate their ideas and reasoning.

When planning a unit of mathematics, teachers draw on a range of key resources, including the NCETM PD materials, the CTK Calculation Policy, Oak National Academy resources, the National Curriculum, and the glossary of mathematical terms.

4.5: Calculations

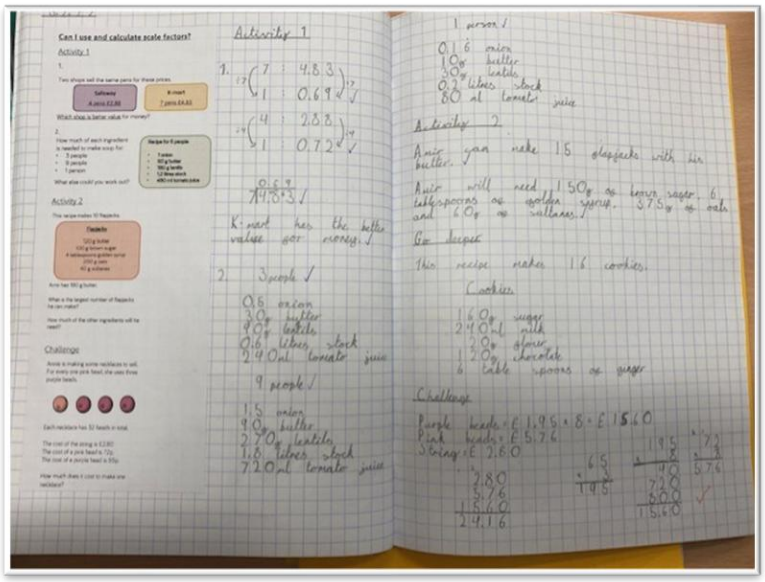
New concepts are introduced by using the concrete, pictorial, abstract approach. A separate policy outlines how calculation is taught at Christ the King. All calculations should follow the CTK Calculation Policy.

4.6: Presentation

Children at Christ the King are expected to take pride in the presentation of their Maths work. They are taught that clear and consistent presentation supports accuracy in calculations, diagrams, and reasoning.

Children at Christ the King will:

- Always use pencil when completing written work in their Maths books.
- Write the short date on the left-hand side of the page and underline it.
- Write the subtitle Review, underline it, and complete the questions underneath, ensuring full calculations are shown rather than answers alone.
- Use joined-up handwriting when writing words in their Maths book.
- Record one digit per square, including when writing fractional numbers.
- Write and underline the tile.
- Write and underline subtitles such as Activity 1, Activity 2, and Go Deeper.
- Show all workings out clearly.
- In Y5/6, underline answers to make them easy to identify.
- Use a ruler to underline/draw "bus stops"/for mathematical diagrams/graphs
- Write in full sentences when reasoning



4.6: Children with Special Educational Needs

At Christ the King, we believe that all children, irrespective of gender, ability, or cultural background, should have equal access to every part of the curriculum. Teaching and learning in mathematics is therefore structured to ensure that every child has the opportunity to realise their potential.

Daily Maths lessons are designed in small, manageable steps so that all children can access the learning and make progress. Teachers aim to include all children fully in lessons, with particular emphasis on oral and mental work, and on the value of pupils observing and listening to peers as they demonstrate and explain their methods (fluency).

Where a child has complex needs, or their mathematical understanding is significantly behind age-related expectations (typically more than a year), additional support may be provided through an individualised programme during the main part of the Maths lesson, as appropriate.

4.7: Catering for "Rapid Grapsers"

Every small step of learning should demonstrate progress and/or enable children to deepen their understanding. All learning must build securely on prior knowledge, with appropriate challenge for all pupils.

Pupils are encouraged to make rich connections across mathematical ideas in order to develop a deep, interconnected understanding. This is supported particularly through the use of *Go Deeper* extension tasks.

Children who grasp concepts quickly are challenged through access to rich and sophisticated problems, provided through the Challenge and *Go Deeper* activities, rather than being accelerated onto new content.

When teaching the whole class, teachers will direct higher-order questions towards those pupils who have rapidly grasped concepts, in order to extend and deepen their reasoning.

4.8: Mathematical Fluency

"We consider someone to be fluent in a technique, procedure, idea, concept or fact at the point at which they no longer need to give attention." Mark McCourt

In order for pupils to be successful in the rich problem-solving activities used in Maths lessons at CTK, dedicated curriculum time is allocated to the explicit teaching of mathematical fluency. This additional practice enables pupils to commit key number facts to automaticity and to secure written methods for the four operations. Each year group has a termly plan of fluency objectives, which are explicitly taught in dedicated Maths Fluency sessions (see Appendix 4).

In **EYFS and Key Stage 1**, every opportunity to *mathematise the day* is taken, with counting embedded into daily routines. Pupils in Years 1 and 2 complete 15 minutes of daily Maths Fluency using the *Number Sense Maths* programme, alongside daily counting practice.

In **Key Stage 2**, one hour per week is dedicated to mathematical fluency.

- In Years 3 and 4, this time is typically used for daily counting, *Number Sense Maths*, and times tables practice.
- In Years 5 and 6, fluency is developed through daily counting, arithmetic quizzes, and use of *Times Table Rockstars*.

4.9 Marking in Maths

Teachers use their discretion on when to complete the whole-class feedback in the Teacher Feedback Book; however, it would be expected that a minimum of two entries are completed per week for Maths.

Teachers tick work in Maths books to acknowledge it has been checked. This should be done in any colour apart from purple. Stickers or stamps may be used to recognise praise or effort. A star symbol or stamp indicates that a piece of work will be shared with the rest of the class as part of a feedback session.

All calculations should be self-marked by pupils using a purple polishing pen. Correct answers are ticked, while incorrect answers are dotted. Any errors must then be corrected by the pupil in purple polishing pen.

Teachers review Maths books promptly and sort them into three piles at the earliest opportunity, ready for Keep Up Maths Intervention.

4.10: Working Walls

To further support pupils, Maths Working Walls must be in place and actively referenced as part of daily lessons (see Appendix 5 for examples).

Key concepts, vocabulary, methods, worked examples, and Steps to Success should be displayed clearly and accessibly, so that pupils can use them to support independent learning during lessons as well as to reinforce future learning.

Working Walls are not static displays; they should be updated by the teacher or teaching assistant regularly during lessons so that they reflect the current focus of learning.

4.11: Intervention in Maths

Children who are underachieving in Maths are identified through a combination of tracking data and teacher knowledge of pupils' progress. These children are placed into targeted intervention groups.

Intervention programmes are designed to accelerate progress by identifying gaps in learning and providing tailored support. Teachers and teaching assistants use Keep Up interventions to pre-teach or revisit small steps of learning where children lack confidence.

These *Keep Up* interventions are delivered outside of the main Maths lesson in specific year groups, ensuring that pupils are supported to keep pace with whole-class learning.

4.12 Effective Deployment of Adults in Maths Lessons

All adults working with pupils should be deployed effectively to maximise learning. They should be aware of the focus children for each class, where appropriate, and their role should be clearly planned within the teacher's weekly Maths plan and through discussion in weekly curriculum meetings.

- **During the Review** – the teaching assistant sits alongside targeted pupils identified as needing additional support or encouragement. This ensures these children can participate fully and benefit from the review.
- **During the I do, We do, You do** – the teaching assistant may produce written materials to add to the Maths Working Wall, making key content accessible to pupils throughout the lesson, while also supporting specific children to understand new concepts.
- **During Activities** – the teaching assistant does not work with the same group each day. Instead, the pupils supported will vary according to need, as identified in the Marking and Feedback Book.
- **During the Challenge** – the teaching assistant again supports targeted pupils, which may include *Rapid Graspers*, to ensure all children are stretched appropriately.

Following the lesson, the teacher will make time to converse with the TA to review pupil progress. Together they will discuss the following:

1. Pupils who have exceeded expectations in the lesson.
2. Pupils who have grasped the concept securely.
3. Pupils who require further support.

4.13 Continuing Professional Development

The school works with the East Midlands South Maths Hub, the Leicestershire and Rutland Primary Maths Network and the Association of Maths Teachers to ensure that all staff have access to high quality professional development and are kept up-to-date on new developments and research in primary mathematics.

Since the introduction of the new EYFS Framework, Maths Leads have worked alongside a Primary Mastery Consultant to embed a teaching for mastery approach in our school. Needs for CPD are identified through regular monitoring and the maths lead provides opportunities for all staff to explore and develop their subject knowledge through regular staff meetings, collaborative planning and teacher research groups.

4.14: Cross-curricular Links

Although Maths is taught as a stand-alone subject, every effort is made to link mathematical learning with other areas of the curriculum. Mathematical opportunities are identified at the planning stage, and teachers draw pupils' attention to these links so that they see mathematics as a connected discipline rather than an isolated subject.

The Maths Lead also works closely with the other STEM subject leaders to establish meaningful cross-curricular opportunities, ensuring that mathematics is embedded across Science, Computing and other related curriculum areas.

5: The Impact of the Mathematics Curriculum at Christ the King

The exploration of mathematics should be interactive and engaging, with content made relevant to children's real-world experiences and contextualised to support consolidation of knowledge and skills.

Children should approach mathematics with confidence and enthusiasm, tackling tasks that draw on different knowledge and skills from a range of units, with assurance and a willingness to collaborate.

Approach and response to reasoning activities should improve term on term, with the expectation that by the end of the year, children are happy to accurately define and use mathematical vocabulary introduced by their teacher.

5.1: Assessment

Assessment at Christ the King is continuous and ongoing. Maths assessment takes place at three connected levels: short term, medium term, and long term. All assessments are used to inform teaching within a continuous cycle of planning, teaching, and assessment.

<u>Short-Term Assessments</u>

Every Maths lesson is designed to include at least four assessment check-points, supported by verbal questioning during discussion. These short-term assessments form an informal part of each lesson and are used to check pupils' understanding and adjust day-to-day planning. Teachers gather this information through observation, questioning, guided work, and marking. Notes from daily formative assessment are recorded in Teacher Feedback Books.

<u>Medium-Term Assessments</u>

Medium-term teacher assessments are made at the start and end of each unit of work. The pre-unit quiz focuses on learning from the previous year, while the post-unit quiz assesses the small steps of learning from the current unit. Any gaps identified at the end of a unit are addressed through additional lessons or targeted intervention.

<u>Long-Term Assessments</u>

Long-term assessments take place termly. These formal assessments are discussed with SLT during Pupil Progress Meetings and are used to inform interventions and target setting. Each term, pupils complete reasoning and arithmetic tests. The scores provide one source of evidence which contributes to the overall teacher assessment for each pupil. At the end of the academic year, a final teacher assessment is reported to parents through the annual written report.

5.2: Monitoring

Maths Leads monitor the teaching and learning of Mathematics at least half-termly, though in practice this often takes place more frequently. Monitoring activities may include lesson visits, book looks, planning reviews, and pupil voice interviews.

Directors for Performance and Standards from the St Thomas Aquinas Multi-Academy Trust (CMAT) also carry out an annual deep dive in Mathematics.

In addition, Maths Leads conduct SEND learning walks, review the books of pupils with SEND, and carry out pupil voice interviews with SEND pupils on a termly basis.

5.3: Attainment and Progress

Attainment and progress in Mathematics are measured through the assessment processes outlined above. Pupil Progress Meetings are held termly with Senior Leaders to review outcomes and next steps.

Teacher assessment information is used by the Maths Lead and SEND Leads to review and amend intervention groups as needed. This ensures that children who are not working at age-related expectations receive appropriate and timely support to address gaps and ensure progress.

6: Monitoring Arrangements

This policy was reviewed in August 2025 and will be reviewed again in September 2026 in response to any changes or advice given by the DfE, especially regarding assessment procedures.

Headteacher: Mrs Annie Carter **Signature:**  **Date:** 31.08.2025

Chair of Governors: Mr Malcom Rossa **Signature:** **Date:**

Date of next review: September 2022

Mathematics Long Term Plan 2024-2025
Reception - Year 6

	Advent		Lent		Pentecost	
	1 (7 weeks 2 days)	2 (8 weeks)	1 (6 weeks)	2 (7 weeks)	1 (4 weeks)	2 (6 weeks)
Reception	Home visits Staggered Start Baseline Pattern Number Focus – 0,1	Number Focus –2 Number Focus - 3 Number Focus - 4 Spatial Reasoning	Number Focus - 5 Number Focus - 6 Number Focus- 7	Pattern Number Focus - 8 Number Focus - 9 Spatial Reasoning Number Focus - 10	Number Focus - 10 Pattern Spatial Reasoning	Number Focus - 11 Number Focus - 12 Transition to Y1
Year 1	**1: Number and Place Value** **2: Comparison of Quantities and Part-Whole Relationships** **3: Number 0-5**	**3: Number 0-5** **4: Recognise, compose, decompose and manipulate 2D and 3D shapes** **5: Numbers 0-10**	**6: Additive structures** **7: Addition and Subtraction facts within 10**	**8: Numbers 0 to 20 Multiplication and Division** **9: Unitising and coin recognition**	**9: Unitising and coin recognition** **Fractions**	**Fractions** **10: Position and direction** **11: Time**
Year 2	**1: Numbers 10 to 100** **2: Calculations within 20** **4: Addition and Subtraction (1)**	**4: Addition and Subtraction (1)** **5: Multiplication**	**6: Division** **7: Shape** **8: Addition and Subtraction (2)**	**9: Measurement: Money** **10: Fractions** **11: Measurement: Time** **12: Position and Direction** **13: Multiplication and Division**	**13: Multiplication and Division** **14: Measurement: Capacity, Volume, Mass**	**Consolidation and administering of KS1 SATs** **14: Measurement: length**

Appendix 1 – Example of Whole School LTP

	Advent		Lent		Pentecost	
	1 (7 weeks)	2 (8 weeks)	1 (6.5 weeks)	2 (5 weeks)	1 (6 weeks)	2 (6 weeks)
Year 3	**1: Adding and subtracting across 10** **2: Numbers to 1000**	**2: Numbers to 1000** **3: Right angles**	**4: Manipulating the additive relations and securing mental calculation** **6: 2, 4, 8 times table** **5: Column addition**	**7: Column subtraction** **8: Unit fractions**	**8: Unit fractions** **9: Non-unit fractions**	**9: Non-unit fractions** **10: Parallel and perpendicular sides in polygons** **11: Time**
Year 4	**1: Column Addition and Subtraction** **2: Numbers to 10,000** **3: Perimeter**	**4: 3,6,9 times tables** **5: 7 times table and patterns** **6: Rounding**	**7: Multiplicative Relationships**	**8: Co-ordinates** **9: Fractions** **10: Fractions Greater than 1**	**9: Fractions Greater than 1** **10. Symmetry in 2D shapes**	**11: Time** **12: Division with remainders**
Year 5	**Roman Numerals** **1: Decimal Fractions** **2: Money**	**3: Negative Numbers** **4: Short Multiplication**	**5: Area and Scaling** **6: Calculating with Decimal Fractions**	**6: Calculating with Decimal Fractions** **7: Factors, Multiples and Primes** **8: Fractions**	**8: Fractions**	**Statistics** **9: Converting Units** **10: Angles**
Year 6	**Number:** Place Value **Number:** Four operations	**Number:** Four operations **Number:** Fractions **Measurement:** Converting Units **Number:** Ratio	**Number:** Algebra **Number:** Decimals **Number:** Fractions, Decimals and Percentages	**Measurement:** Perimeter, Area and Volume **Statistics:** Line graphs, pie charts, mean **Geometry:** Properties of Shape **Geometry:** Position and Direction	**Consolidation and administering of KS2 SATs** **NCETM Ready to Progress**	**NCETM Ready to Progress**

Appendix 2

Christ the King Catholic Voluntary Academy
Maths Medium Term Plan

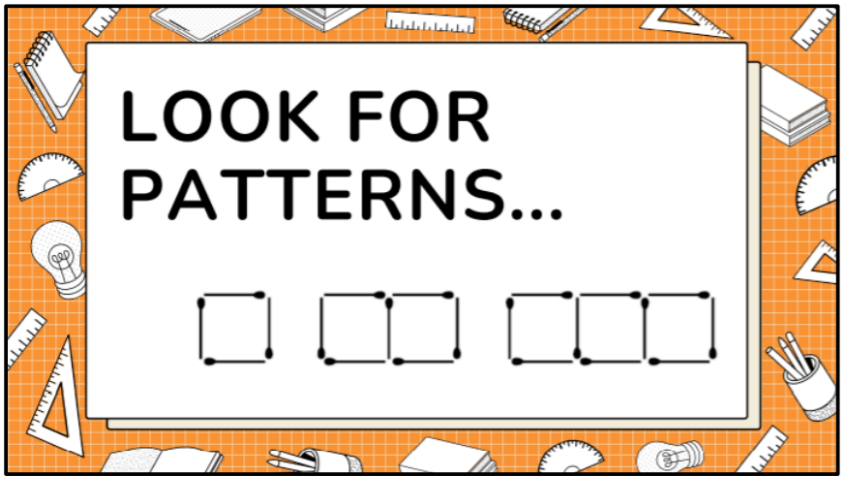
Unit: Column Subtraction	NC Objectives and WRM Small Steps	Lent 2: Week 2 – QFLs	Start Date: 13/03/24
Prior Learning: Knowledge of place value. Column addition Subtraction on a number line Subtraction by partitioning Subtraction by counting on	**3AS–2 Columnar addition and subtraction** Add and subtract up to three-digit numbers using columnar methods. **3AS–2 Teaching guidance** Pupils must learn to add and subtract using the formal written methods of columnar addition and columnar subtraction. Pupils should master columnar addition, including calculations involving regrouping (some columns sum to 10 or more), before learning columnar subtraction. However, guidance here is combined due to the similarities between the two algorithms. Beginning with calculations that do not involve regrouping (no columns sum to 10 or more) or exchange (no columns have a minuend smaller than the subtrahend), pupils should: • learn to lay out columnar calculations with like digits correctly aligned • learn to work from right to left, adding or subtracting the least significant digits first Teachers should initially use place-value equipment, such as Dienes, to model the algorithms and help pupils make connections to what they already know about addition and subtraction.	**Week 1** **Lesson 1:** **Can I identify the minuend and the subtrahend and complete column subtraction equations?** **Resources; dienes and place value charts, individual whiteboards.** **Lesson 2:** **Can I use column subtraction to answer equations involving exchanging in the ones column?** **Resources; dienes and place value charts, individual whiteboards.** **Lesson 3:** **Can I subtract from a 3-digit number using column subtraction with exchanging from hundreds to tens? (1)** **Resources; dienes and place value charts, individual whiteboards.** **Lesson 4:** **Can I subtract from a 3-digit number using column subtraction with exchanging from hundreds to tens? (2)** **Exchanging in the hundreds and tens columns and subtraction when there are zeros in the minuend.** **Lesson 5:** **Can I evaluate the efficiency of strategies for subtraction?**	**Vocabulary:** **Subtrahend** **Minuend** **difference** **Stem sentences:** **Language focus** "3 ones plus 5 ones is equal to 8 ones." "4 tens plus 2 tens is equal to 6 tens." "5 ones minus 3 ones is equal to 2 ones." "6 tens minus 2 tens is equal to 4 tens." **Key Knowledge:**
Possible misconceptions			

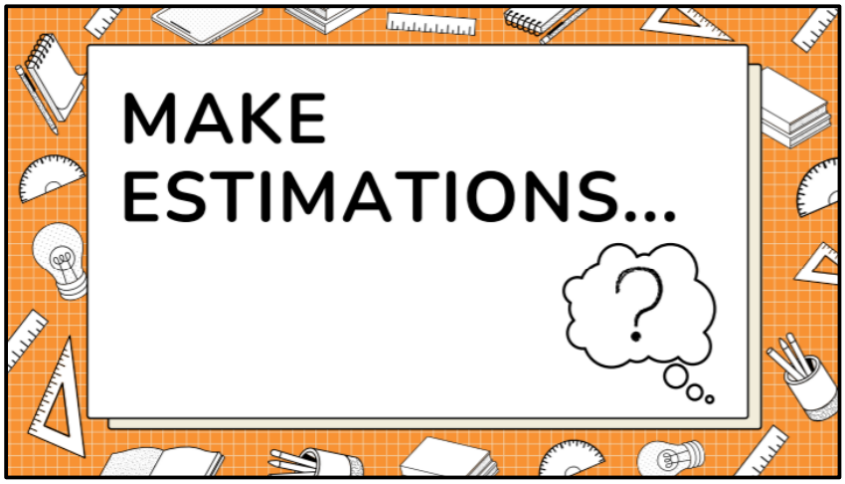
Lesson	Key knowledge	Possible misconceptions
1	Making subtraction equations. You only make the minuend, then subtract the subtrahend to find the difference. **Stem sentence:** **__ ones subtract ___ ones equals ___ ones.** **__ tens subtract ___ tens equals ___ tens.** First part of lesson is practical, children make column subtractions using dienes and place value charts. Model how to answer column subtraction questions, emphasise putting digits in the correct column and starting on the right (this will be the ones but when they come to decimals, need to know they start on the right and not with the ones). Chn to answer column subtracting questions, two and three digits, no exchanging.	**Marking book** **Activity 1:** **Children make subtrahend as well as minuend.** **Not starting with the ones.** **Activity 2:** **Not putting digits in the correct columns.** **Not using a ruler to draw the equals sign.** **Not starting with the ones.** **Adding instead of subtracting the columns.**
2	**Exchange not borrow – nothing is being returned.** **Show exchanging physically next to the abstract representation:** • Begin by using dienes to represent a column subtraction you can do without exchanging. • Write 67 – 28 on the whiteboard. Make 67, start from the right, try to subtract 8. Explain that 'I don't have enough ones, I need to **exchange** a ten for tens ones'_'. **If the minuend is smaller than the subtrahend, you have to exchange.** • Finish the calculation by the subtracting the ones and tens and writing the answer. Repeat with another example 53 – 17. **Chn to complete activity 1 practically with place value charts, dienes and white boards.** Use the same language as when you subtracted physically to model column subtraction on the whiteboard, e.g. 94 – 26 I don't have 6 ones, I need to exchange one of my tens for 10 ones, now I have 8 tens and 14 ones.	**Activity 1:** **Not starting with the ones** **Not removing a ten when adding ten ones** **Not writing the equation down when making it physically** **Not crossing out the tens number and reducing it by 1 on the written equation.** **Not writing the additional 1 to the ones column on the written equation.** **Activity 2:** **Not writing digits in the correct column** **Not starting with the ones** **Chn subtracting the minuend from the subtrahend** **Adding a one to the ones but not subtracting one from the tens** **Making an error when subtracting**
3	**Exchanging in the tens column** • Begin by using dienes to represent a column subtraction you can do without exchanging. • Write 327 – 143 on the whiteboard. Make 327, subtract the ones, write the answer on the whiteboard. • Try to subtract the tens explain that 'I don't have enough tens, I need to exchange a hundred for 10 tens'_'. **If the minuend is smaller than the subtrahend, you have to exchange.** Make the exchange with the dienes and show this on the whiteboard:	**Marking book** **Activity 1:** **Not starting with the ones** **Not removing a hundred when adding 10 tens** **Not writing the equation down when making it physically** **Not crossing out the hundreds number and reducing it by 1 on the written equation.** **Not writing the additional 1 to the tens column on the written equation.**

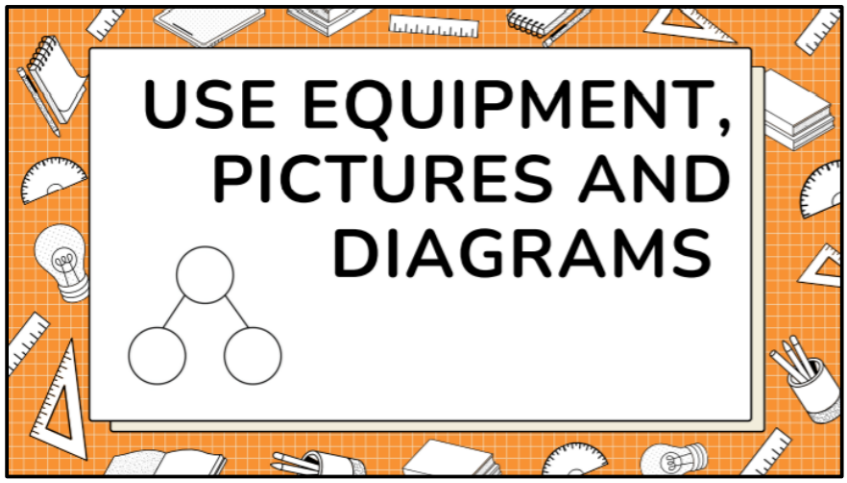
	crossing out 3 hundreds and writing 2 hundreds and adding the 1 to show 12 in the tens column. • Finish the calculation by the subtracting the tens and hundreds and writing the answer. **Chn to complete activity 1 practically with place value charts, dienes and white boards.** Use the same language as when you subtracted physically to model column subtraction on the whiteboard **e.g. 938 – 162 I don't have 6 ones, I need to exchange one of my hundreds for 10 tens, now I have 8 hundreds and 13 tens.**	**Activity 2:** **Not writing digits in the correct column** **Not starting with the ones** **Chn subtracting the minuend from the subtrahend** **Adding a one to the tens but not subtracting one from the hundreds** **Making an error when subtracting**
4	Exchanging in the ones and tens column. Explain that we may need to exchange from the ones and tens column. Remind chn of our rule: **'If the minuend is smaller than the subtrahend, you have to exchange.** Live model answering equations with exchanging in both columns. Subtraction with zeros in the minuend. Reminder of rule: **'If the minuend is smaller than the subtrahend, you have to exchange.** Live model how to answer equations with zeros in the minued (no double exchanges).	**Marking book** **Not writing digits in the correct column** **Not starting with the ones** **Chn subtracting the minuend from the subtrahend** **Adding a one to the tens but not subtracting one from the hundreds** **Making an error when subtracting** **Not using the exchanged tens number when subtracting the tens column**
5	Column subtraction is not always the most efficient method. Children deciding when to use the column method and when to use mental strategies.	

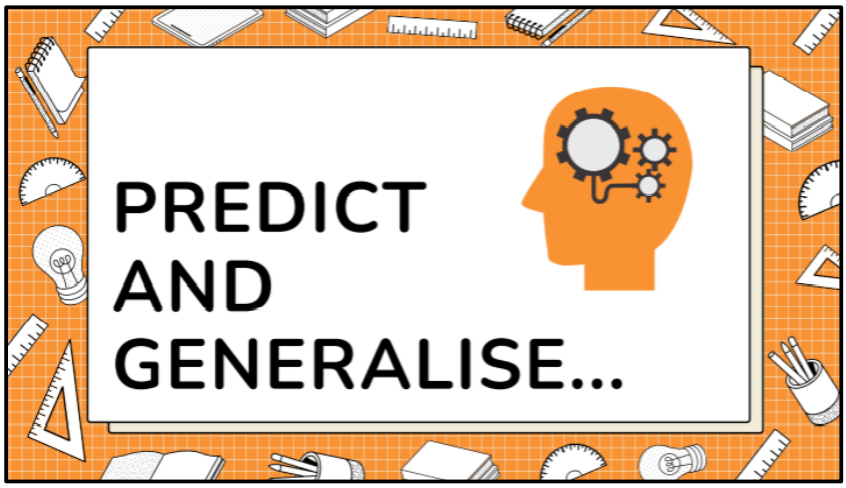
Appendix 3

What do Good Mathematicians Do? (Maths Disciplinary Knowledge)









WORK SYSTEMATICALLY

EXPLAIN THEIR MATHEMATICAL THINKING

ARE CURIOUS ABOUT NEW METHODS

APPLY THEIR KNOWLEDGE TO OTHER SUBJECTS

Appendix 4

Example of Maths Fluency Termly Planning

Year 1

	Advent	Lent	Pentecost
Counting	Daily Counting: Count to and across 20, forwards and backwards, beginning with 0 or 1, or from any given number	Daily Counting: Count to and across 50, forwards and backwards, beginning with 0 or 1, or from any given number	Daily Counting: Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
	Count forwards and backwards in multiples of two to 20	Count forwards and backwards in multiples of five to fifty	Count forwards and backwards in multiples of tens
Number Sense Maths	Subitising 1-5	One more, one less	Ten and a bit
	Subitising 6-10	Two more, two less	
	Subitising 1-10	Number 10 fact families	
	Number bonds: Make and break 5	Five and a bit	
	Number bonds: Make and break 4, 3 and 2	Know about zero	
	Number bonds: Make and break 10	Doubles and near doubles	
	Number bonds: Make and break 6	Number neighbours – adjacent numbers (odd and even numbers)	
	Number bonds: Make and break 7	7 tree and 9 square	
	Number bonds: Make and break 9	Strategy selections	
Number facts	Identifying structured subsitisation on tens frames to 20	Add and subtract one-digit numbers within ten	Add and subtract ten from numbers within twenty
	Number bonds within ten which use three numbers (a + b + c = d)	Knowing how to solve missing number calculations within 10	Knowing how to solve missing number calculations within 20
	Understand and explore commutativity	Halves within 10	
Measures	Know the order of days of the week	Know the order of months of the year	Know the order of the seasons
	Tell the time to the hour	Tell the time to the half hour	Tell the time to the hour and the half hour

Appendix 5

Maths Working Wall Examples