Christ the King Catholic Voluntary Academy

Mathematics Policy

Approved by Chair of Governors	
Date of Approval	
Date of review	**October 2024**

Christ the King Catholic Voluntary Academy

Mathematics Policy 2024-25

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 White Rose Maths Small Steps teaching sequences or 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.

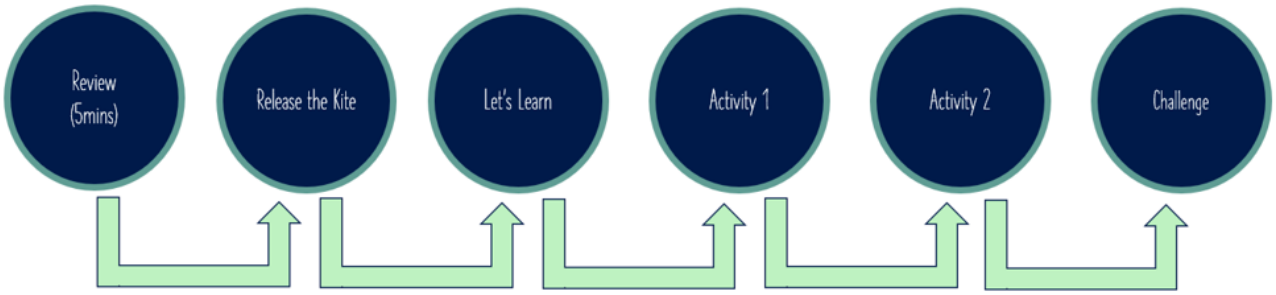
Daily *Keep Up* interventions provide additional opportunities for practice, which enable almost all pupils to move through units of work at the same pace, studying the curriculum for their year group.

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)

We begin each lesson with a short review of previous learning. Usually this involves 2-3 fluency-based questions similar to those completed in the previous lesson, previous unit or previous year. These questions address any conceptual pre-requisites required for the children to be successful in the new learning. Children self-mark these questions in purple polishing pen.

Release the Kite (3 mins)

The teacher will then *Release the Kite*. This involves the sharing a problem, usually based in a real-life context, which relates to the new mathematical concept the children will be learning that day. The children will work in mixed-ability pairs for five minutes to complete the problem on whiteboards. The teacher will then select two or more of the pupils' whiteboards to display under the visualiser as examples of different methods and discuss which method was most efficient. Children are often invited to the front to explain their mathematical methods and reasoning.

At Christ the King, we *Release the Kite* for each small step of learning as we know it is important to teach *through* problems, rather than *for* problem solving. This is because we want the children to know how the mathematics they are learning about fits into the world around them and how it can be applied to real life situations.

A Go Deeper extension task will be provided to stretch and deepen pupil understanding at this stage of the lesson. This will relate to the question asked in the *Release the Kite* and not be a brand-new calculation in its own right.

Let's Learn (10mins)

The teachers will then work through a number of examples on the interactive whiteboard. They will think aloud, model steps, create success criteria where appropriate, use practical/pictorial representations to support their explanations and make reference to the disciplinary knowledge required. During this part of the lesson we see the "I do" (teacher models and children watch), "We do" (teacher takes ideas from pupils, and teacher/children complete calculation on their whiteboards) and "You do" (teacher watches closely for misconceptions as children follow the steps modelled to them to complete a calculation/problem).

The Let's Learn section of the Maths lesson is rich in contextual variation: the children see the same concept but in a range of different ways. We encourage children to find both examples and also non-examples of this new concept.

Activity 1 (10 mins)

The children will then complete the independent activity: “Activity 1”.

In line with Rosenshine’s principles, the teacher will limit the amount of material students receive at one time. Children complete 3-6 questions, carefully designed to be as close to the examples taught in the Let’s Learn part of the lesson. These questions will be crafted using the principles of conceptual or procedural variation. Intelligent practice in question design enables the teacher to determine and address any possible misconceptions and provides deliberate opportunities for pupils to make connections and spot patterns in the mathematical concepts they are studying.

A Go Deeper extension task will be provided to stretch and deepen pupil understanding. This will relate to the questions asked in Activity 1 and not be a brand-new calculation in its own right.

The children self-mark their work using purple polishing pen.

As the children work through the same activities at the same time, this provides the opportunity for detailed discussion once the questions are completed. As part of these discussions, teachers ask questions to assess for gaps in pupil understanding: What do you notice? What’s the same? What’s different? How do you know? Do you agree? What if? Convince me. Which is the most efficient method and why? Can you make a generalisation?

All teachers have high expectations and remind pupils to explain their mathematical thinking in full sentences, using the correct mathematical vocabulary.

Activity 2 (10-15mins)

The teacher will then model a further example, varying one aspect of the problem to increase the difficulty (I do/We do).

Children will then complete 3-6 questions of this type of question independently (You Do).

A Go Deeper extension question will be provided to stretch and deepen pupil understanding. This will relate to the questions asked in Activity 2 and not be a brand-new calculation in its own right.

The children self-mark their work as in Activity 1, discussing their answers as a whole class.

Challenge (5-10 mins)

The Challenge is a low-threshold, high ceiling task which all children can access; however, it should be of sufficient difficulty that it stretches high attaining pupils and not be designed for all pupils to be able to solve entirely.

These types of rich problems should involve the children applying their knowledge from that lesson with other mathematical concepts they have learned previously.

A Go Deeper extension question will be provided to stretch and deepen pupil understanding. This will relate to the question asked in the Challenge and not be a brand-new calculation in its own right.

The children should attempt this problem independently/in pairs and then as a class come together to discuss their methodology.

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: Review, Release the Kite, Let’s Learn, Activity 1, Activity 2, Challenge structure; however, there are occasions when more explanation may be necessary and there may be only one Activity

provided. Equally, there are some small steps which work best when broken into smaller steps and teachers may feel it appropriate to have 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 in terms of vocabulary is an expectation in all subjects at Christ the King, and in Maths this is no different. Maths vocabulary is a focus in the mathematics medium term planning documentation and it should be used in the correct way in order to develop children's knowledge.

Stem sentences are used by <u>all</u> year groups.

Teachers will refer to the NCETM PD materials, White Rose Maths Schemes of Learning, the CTK Calculation Policy as well as the National Curriculum and the glossary of terms, when planning a unit of mathematics.

Teachers model the correct use of mathematical vocabulary in maths lessons through use of stem sentences. Children are encouraged to use the correct mathematical language and terminology to discuss their mathematical ideas and reasoning.

4.5: Calculations

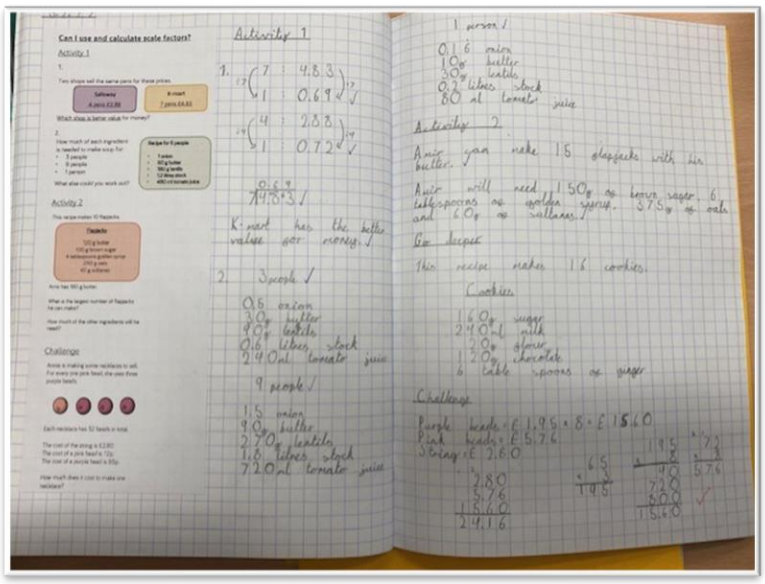
New concepts are introduced by using the concrete, pictorial, abstract approach. A separate policy outlines how calculation is taught at Christ the King. All calculations should follow the CTK Calculation Policy.

4.6: Presentation

Children at Christ the King take pride in their work in their Maths books. They understand that presentation is important to ensure accuracy in mathematical methods and diagrams.

Children at Christ the King:

- 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
- Write the subtitle: Review. The underline this subtitle and then complete the questions below, writing the full calculation and not the answer alone
- Use joined-up handwriting when writing in words in maths book
- Use one number per square, including for fractional numbers
- Write and underline the Question for Learning
- Write and underline subtitles: Activity 1/Activity 2/Go Deeper
- Show all workings out
- Underline answers to make them clear
- 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, ethnic or cultural origins, should have equal access to all parts of the curriculum and that teaching and learning is structured so that each child has every opportunity to realise personal potential within mathematics. The daily maths lesson is designed to build in small steps so that all children can access the learning and make progress. Teachers will aim to include all children fully in their daily mathematics lessons. All children benefit from the emphasis on oral and mental work and watching and listening to other children demonstrating and explaining their methods (fluency).

In instances where a child has complex needs or whose mathematical understanding is over a year behind age-related expectations, the child will need to be supported with an individual programme during the main part of the maths lesson (as appropriate).

4.7: Catering for "Rapid Grapsers"

Every small step of learning should show progress and/or help children to deepen their understanding. All learning should build upon prior knowledge and all children should be challenged.

Pupils are encouraged to make rich connections across mathematical ideas to develop deep interconnected understanding, particularly through the Go Deeper extension tasks.

Pupils who grasp concepts rapidly should also be challenged through being offered rich and sophisticated problems through the *Challenge* and *Go Deeper* questions rather than being accelerated onto new content.

When working with the whole class, teachers will direct higher order questions towards those pupils who grasp concepts quickly.

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, additional curriculum time is put aside to teach mathematical fluency. This additional practice time enables pupils to learn number facts to automaticity and practise written methods for the four operations. Each year group has a termly plan of fluency objectives which are explicitly taught in Maths Fluency sessions (Appendix 4).

In EYFS/KS1, every opportunity to mathematise the day is taken and counting is part of everyday practice. Pupils in Y1 and Y2 complete 15 minutes of daily maths fluency using the Number Sense Maths programme and complete daily counting practice.

In KS2, an hour per week is spent on mathematical fluency. In Y3/4 this is through daily counting, Number Sense Maths and times table practice. In Y5/6 this is typically through daily counting, arithmetic quizzes and Times Table Rockstars.

4.9 Marking in Maths

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

Teachers tick work in Maths books to acknowledge it has been looked at. This should be done in any colour apart from purple.

Teachers may use a sticker/stamp for praise or effort.

Teachers use a star symbol/stamp when they plan to share a piece of work with the rest of the class as part of a feedback session.

All calculations should be self-marked by pupils using purple polishing pen. Correct answers are ticked, incorrect answers are dotted.

Any incorrect calculations should be corrected by the pupil with their purple polishing pen maths.

Teachers look at Maths books and sort into three piles at the earliest opportunity ready for Keep Up Maths Intervention in the afternoons.

4.10: Working Walls

In order to further support children, Maths Working Walls are to be used and referenced as part of daily lesson. See Appendix 5 for examples of Maths Working Walls.

Key concepts, vocabulary, methods, worked examples and *Steps to Success* will be recorded where they will be easily accessible to pupils in order to aid independent learning within the lesson as well as any future learning.

Working Walls will be updated by the teacher/teaching assistant during the delivery of the lesson.

4.11: Intervention in Maths

Using tracking data, combined with teacher's knowledge of children's progress, children who are underachieving in Maths are identified and placed into target/intervention groups.

These programmes are intended to accelerate progress of individual children, identifying gaps in learning and providing targeted support for these children.

Teachers/TAs pre-teach/re-visit small steps of learning where children lack confidence. These *Keep Up* interventions are delivered outside of the normal maths lesson in specific year groups.

4.12 The Role of the Teaching Assistant

All adults working with the children should be used effectively in order to develop the children's knowledge and they should be aware of the focus children for the class where appropriate. Teaching assistants are planned for within the teacher's weekly maths plan.

During the Review, the TA will sit near targeted pupils who have been identified as needing extra support or encouragement so that they can participate to the best of their ability and gain the most from the lesson.

During the Let's Learn, the TA will produce written materials to add to the Maths Working Wall to aid children throughout the lesson and support pupils to understand new concepts.

Within the activities, the TA will not necessarily work with the same group every day, the pupils they work with will change from lesson to lesson and be identified in the Marking and Feedback Book.

During the Challenge, the TA will again support targeted children, potentially Rapid Graspers at this stage of the lesson.

The teacher will make time to converse with the TA to assess children's achievement within that lesson, sorting the exercise books into three piles: one pile for those who have exceeded expectations in the maths lesson, one pile for pupils who have grasped the concept and one pile for 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 Mathematics is taught as a stand-alone subject, every effort is made to link mathematics with other areas of the curriculum. Mathematical possibilities are identified across the curriculum at the planning stage. We also draw children's attention to the link between mathematics and other curricular work so children see that mathematics is not an isolated subject.

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 mathematical study with confidence and enthusiasm, and view tasks and challenges that call for application of varied knowledge across units of work and the selection of multiple skills with self-assuredly 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.

Assessments are used to inform teaching in a continuous cycle of planning, teaching and assessment.

1. Short Term Assessments: Every maths lesson is designed for there to be at least four assessment check-point opportunities for teaching staff, which should also be supplemented through verbal questioning during discussion. Short term assessments will be an informal part of every lesson to check pupils understanding, this will assist in adjusting day-to-day lesson plans. Teachers will gain this information through observations, questioning, guided work and marking. Notes of day-to-day formative assessment are recorded in Teacher Feedback Books.

2. Medium Term Assessments: Medium term teacher assessments are made at the start and the end of every unit of work. The pre-unit quiz is based on learning from the previous year and the post unit quiz is based on the smalls steps of learning of the current unit. Where gaps remain at the end of a unit, these are addressed through additional lessons/intervention.

3. Long Term Assessments: Long term assessments take place on a termly basis. These formal assessments are discussed with SLT in Pupil Progress Meetings and used to inform any relevant intervention and target setting. Termly assessment are comprised of reasoning and arithmetic tests. The scores from these tests feed are just one source of information which feeds into the overall teacher assessment for each pupil. At the end of each year, a final teacher assessment level is reported to parents through the annual written reports.

5.2: Monitoring

Maths Leads conduct half termly monitoring: lesson visits, book looks and pupil voice interviews.

Maths Leads, Senior Leaders and the Director for Performance and Standards conduct termly pupil voice interviews to assess for consistency in implementation and to check for pupil understanding of key concepts.

Maths Leads conduct SEND learning walks, review SEND pupils books and conduct SEND pupil voice interviews on a termly basis.

5.3: Attainment and Progress

Attainment and progress are measured through the assessment process outlined above. Pupils progress meetings are held on a termly basis with Senior Leaders.

Teacher assessment information is used by the maths subject leader/SEND Leads to amend any intervention groups and ensure that those children who are not working at age related expectations are provided with the support they need.

6: Monitoring Arrangements

This policy was reviewed in October 2024 and will be reviewed again in September 2025 in response to any changes or advice given by the DfE, especially regarding assessment procedures.

Headteacher: Mrs Annie Carter **Signature:**  **Date:** 9.10.24

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

	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

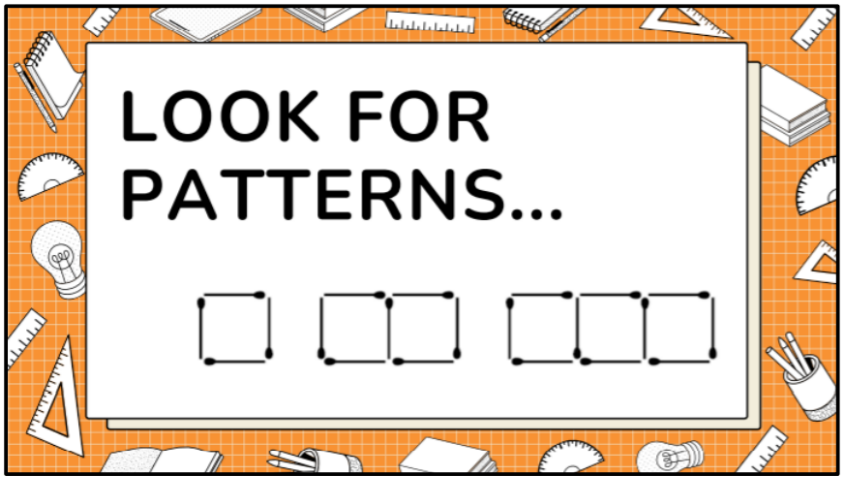
Unit: Column Subtraction	NC Objectives and WRM Small Steps	Lent 2: Week 2 – QFLs	Start Date: 13/03/24
Prior Learning: Knowledge of place value. Column addition Subtraction on a number line Subtraction by partitioning Subtraction by counting on	**3AS–2 Columnar addition and subtraction** Add and subtract 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.**	**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."
	Possible misconceptions	**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?**	**Key Knowledge:**

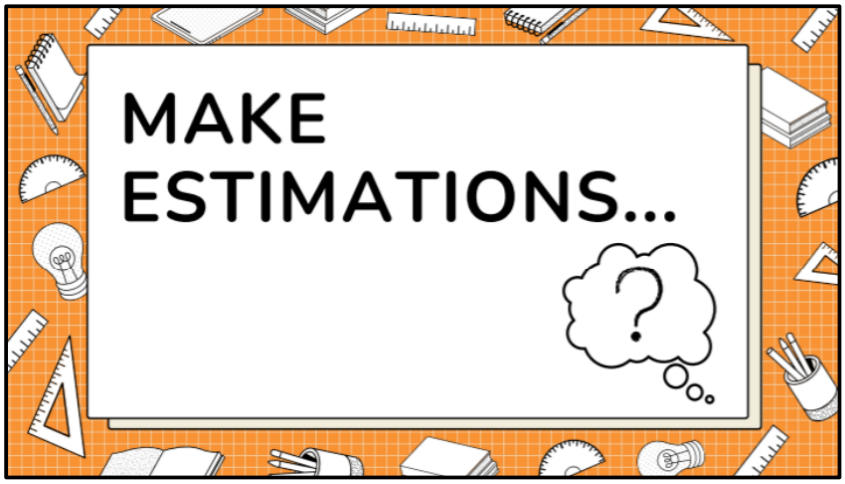
Lesson	Key knowledge	Possible misconceptions
1	Making subtraction equations. You only make the minuend, then subtract the subtrahend to find the difference. **Stem sentence:** **__ ones subtract ___ ones equals ___ ones.** **__ tens subtract ___ tens equals ___ tens.** First part of lesson is practical, 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.**

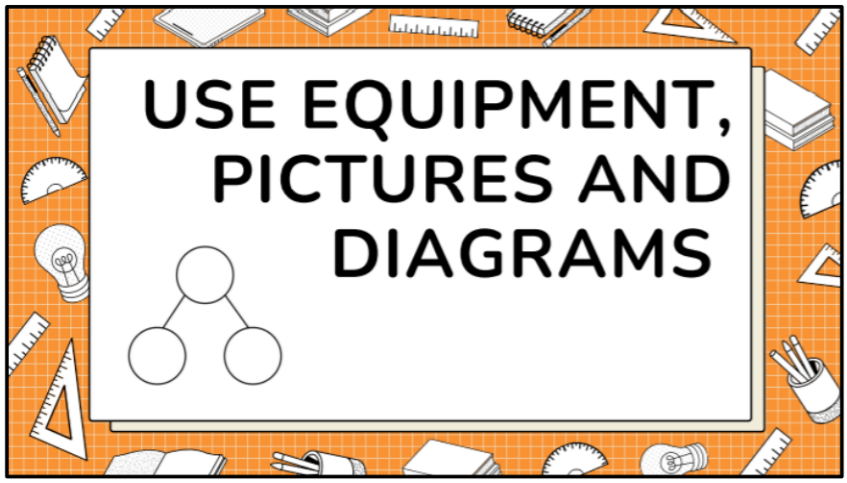
	crossing out 3 hundreds and writing 2 hundreds and adding the 1 to show 12 in the tens column. • Finish the calculation by the subtracting the tens and hundreds and writing the answer. **Chn to complete activity 1 practically with place value charts, dienes and white boards.** Use the same language as 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.	

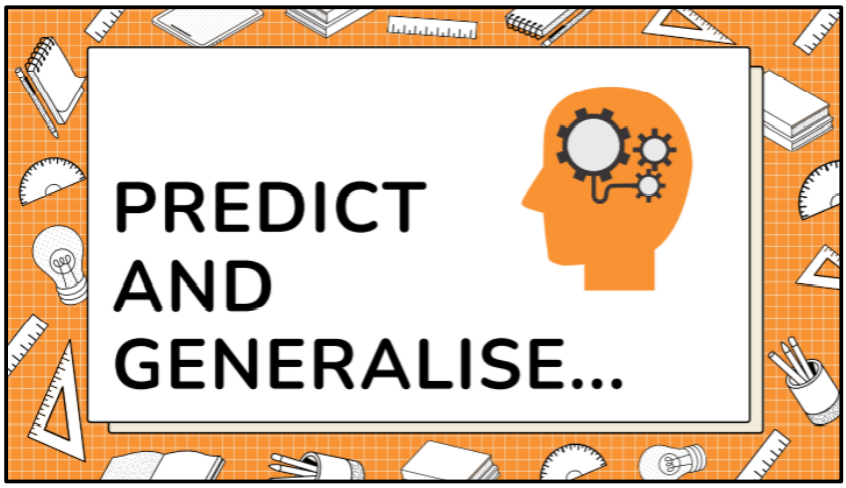
Appendix 3

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