Jerry Clay Academy

Maths
Guidance Document

September 2024

Review Date: September 2026

Introduction

The teaching and Learning of Maths is fundamental to ensure every children' success as a life-long learner, and citizen of the world. We are committed to ensuring that every pupil becomes a fluent and confident mathematician ready for their future lives.

Purpose of Study

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Primary National Curriculum

Intent

Maths is explicitly taught at every phase of children' education and it is paramount that children make a positive start at Jerry Clay Academy. We promote a positive 'Everyone can' attitude to learning Maths ensuring every child is supported to become numerate and confident in Maths. Maths is taught explicitly and is also embedded throughout the curriculum, using and applying Maths learning to support learning in other curriculum areas. We use our learner traits (perseverance, thinker skills, inquirer, communication, team work, risk taker and caring) to teach children to become fluent mathematicians and empower them to take on new challenges and to use Maths in complex and creative problems solving.

EYFS

The children in EYFS experience rich learning opportunities which foster and develop mathematical thinking. Alongside this, they practise and develop fluency with basic number facts and learn about key mathematical code and representations such as numerals, signs and number sentences. This prepares them to continue their Maths learning in Key Stage 1.

Mastery

Aligning with the experiential opportunities in EYFS, we use a mastery approach to teaching and learning in Maths to ensure that children develop deep and lasting understanding of mathematical procedures and concepts.

We use the White Rose Maths Scheme of Learning as a guide and follow their yearly overview to ensure that sufficient time is given to build and develop number competency as well as to ensure coverage of the full range of mathematics within the Primary National Curriculum. The emphasis is on a 'Everyone Can' Maths approach and teachers plan sequences of lessons, targeted support and interventions to ensure that children are enabled to stay together and to master Maths.

Each mathematical concept or procedure is built up in 'Small steps' with guidance taken from White Rose Maths Scheme Small steps Guidance and from progression in the strands of the DfE Ready to Progress Criteria.

Concrete, Pictorial and Abstract

When introducing concepts, children are given the opportunity to support their understanding using concrete manipulatives alongside pictorial models. These may also help the children to explain their reasoning and to apply their skills to problem solving.

Children learn to use a range of pictorial representations including part whole models, bar models, number lines, place value charts etc. Ultimately, we aim for children to be confident with independent use of abstract mathematical methods.

Calculations

Efficient Calculation methods (both mental and written) are taught as set out in our Calculation Policy. Children are supported to understand efficient methods and then to use them fluently. Children develop efficient, accurate and clear methods for the four operations and they learn to present them logically and neatly to reduce the risk of accidental errors. A culture of repetition is key to ensuring that children achieve automaticity with these calculation methods.

Explicit instruction

Explicit instruction is one effective method for teaching all groups of children, and stronger children can benefit from increased variation and additional intelligent practice rather than moving on faster. Teacher provide models and scaffolding to support children to learning information but consider when to withdraw these so that children do not become dependent on them.

Why Fluency?

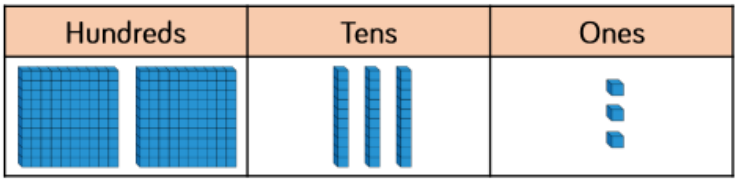
Once concepts are secure, children are taught to increase the speed and fluency of key number facts and calculations. Our JCA Mental Maths Progression document sets out for each year group which number facts should be learned for rapid or automatic recall and specific mental Maths strategies that are needed.

Practice using low stakes quizzes has a positive impact on memorization. Gaining automaticity in in key knowledge reduces the risk of overloading the children' working memory and allows them to tackle more complex Maths.

Maths Talk and Vocabulary

Children are supported with their understanding of Maths through rich use of Mathematical Talk and Vocabulary.

Language structures (Stem sentences) provide children with the ability to articulate their understanding, in turn allowing them to reason and to apply their understanding to solving problems.

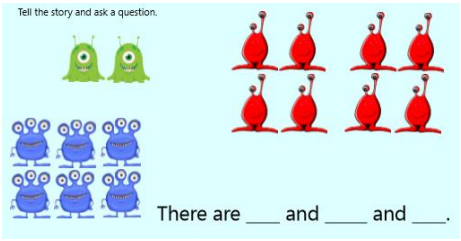


"There are 2 hundreds and 3 tens and 3 ones. The numbers if two hundred and thirty three."

Questioning challenges children to gain a deep understanding of concepts and they support one another to explain using partner talk.

Can you show me the hundreds/tens/ones in the number?

Which resource do you prefer to use for larger numbers? Which is quickest? Which would take a long time?



Pupils are encouraged to **tell the story and ask the question.** This allows them to relate the mathematical concept to a concrete example or to real life.

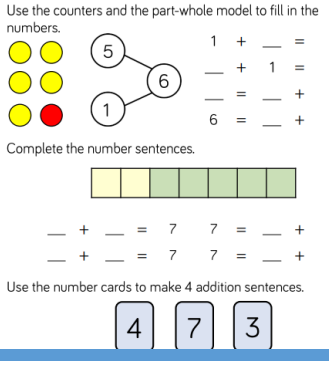
Q: How many aliens are there altogether?

This is only one question that could be asked but it is the question that matches the story and the concept of combining of three small groups (addition). Other possible questions could be 'Are there more, green, blue or red aliens?' which relates to comparing numbers or 'How many more red aliens are there than blue aliens?' which relates to finding the difference between two groups. Tell the story and ask the question is a powerful way of supporting children to understand mathematical concepts.

Correct mathematical vocabulary is introduced to describe mathematical concepts and displayed on the working wall during each unit of learning. Additionally, children are supported to use a range of reasoning frames to articulate their mathematical reasoning such as 'I know this because…' and 'The strategy I used was …'

Variation and Intelligent practice

Our aim is to provide children with opportunities to encounter mathematical concepts in all its different forms.



Ensuring that not every practice exercise looks the same prevents mechanical repetition and ensures that pupils are given every opportunity to explore the concept and to understand fully.

Teachers choose examples carefully to encourage children to develop their understanding of the concept and to look for connections between concepts and to use what they have learned in one problem to help them with the next. This helps children to develop their reasoning skills and conceptual understanding.

In this example , the digits 2,6,and 0 are used consistently throughout instead of randomly using different digits so that the pupil is encouraged to focus on the intended mathematical concepts.

2 x 6 =	2 x 6 =
2 x 60 =	2 x 0.6 =
2 x 600 =	2 x 0.06 =
20 x 6 =	0.2 x 6 =
200 x 6 =	0.02 x 6 =

Making connections

Children are also taught different methods and explore when different methods would be most useful. Children are taught how and when to apply different calculations to solve problems. They explain which method they used and why using Maths Talk.

Our intent is that fluency with recall or facts and procedures enables children to choose and use efficient calculation methods and to make connections and apply them to other areas of Maths. For example, children must have rapid recall of multiplication facts and related division facts to be able to recognize multiples, solve division problems and later to convert improper fractions to mixed numbers.

Problem Solving

Problem solving is taught alongside the curriculum content so that children can develop their conceptual understanding. Children are taught Maths specific strategies for approaching different problem types so that they increase in confidence in tackling problem solving more independently.

'Can do' Maths and the Jerry Clay Learner Traits

In order to develop a 'Can do' Maths attitude for all children and to encourage children to aspire to attain highly, the Jerry Clay Learner Traits are emphasised in all Maths learning and valued in how they support individuals to make progress. Children are encouraged to take a *risk* and to be a *thinker* in order to take on new mathematical challenges. Teachers and teaching assistant support different learners with strategies to gain secure understanding of Maths. Children are further encouraged and motivated to *persevere* and succeed in their Diamond Dash.

At Jerry Clay Academy, we ensure that children have ownership over their own learning and so teach them strategies both for ensuring that they learn more, remember more and can do more and also that they have strategies to tackle more complex tasks with increasing independence.

Marvellous Mistakes

We know that in order to make progress and to learn more, remember more and do more, we need to challenge ourselves. At Jerry Clay Academy, we teach the children that it is ok to make a mistake and that this is necessary to move our learning forward. In doing so we show our *risk taker, thinker, inquirer, communication and perseverance* learning traits. Discussing the 'marvellous mistakes' that we make allows us to gain a deeper and fuller understanding of the mathematical concepts.

Implementation

Each individual class teacher is responsible for the planning of Maths for their class in line with the National Curriculum expectations. Planning is completed for each session based on the needs of the children within the class and the next steps that are needed within their learning. At Jerry Clay Academy, Maths units are taught discreetly, and cross-curricular links are made with other areas of the curriculum, as much as possible.

We use the White Rose Maths Scheme of Learning as a guide and follow their yearly overview to ensure that sufficient time is given to build and develop number competency as well as to ensure coverage of the National Curriculum.

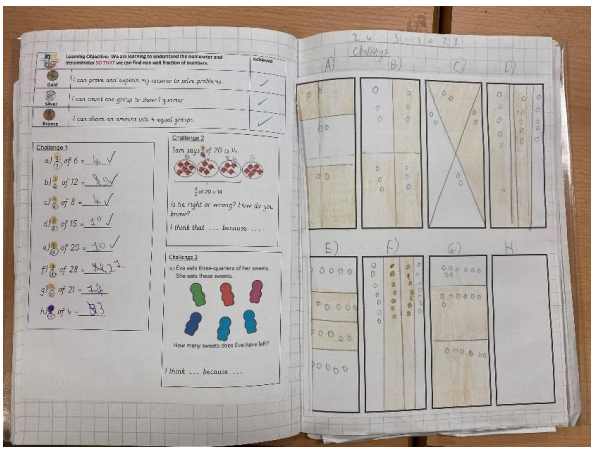
Units of work are planned - according to the needs of the children within the class- and are based upon gaps in learning that are identified after children complete a '**Cold Maths** task. The 'Cold Maths' task printed on blue paper allows teachers to assess children' recall of prior learning. Using this knowledge, teachers plan a series of lessons and learning opportunities. Teachers use the Small steps guidance for each topic of Maths as well as their knowledge of the children to prepare their medium term plans and are then able to draw on resources from the Small Steps Guidance to plan lessons.

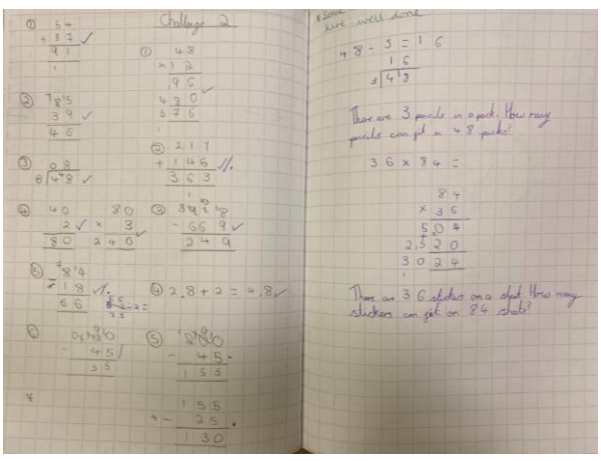
Resources

Teachers are guided by their knowledge of the children and the White Rose Maths Scheme of Learning and related premium resources which act as both invaluable resources and pedagogical guidance for each unit of learning. Teachers are also supported and guided by the DfE Ready to Progress Criteria Guidance Documents and a range of additional resources saved on the Staff Shared / Academy Maths folder. Staff have opportunities to share best practice at half termly updates in staff meetings.

Challenge Sheet

Teachers create three learning challenges for lessons providing opportunities for all children to practise their fluency of a concept in challenge 1. Challenges 2 and 3 increase in complexity and may provide additional opportunities to develop fluency, to explain reasoning or to attempt the more complex problem solving associated with Greater Depth learning.





maths books throughout the academy and children use their pencil and ruler neatly. Pupils are expected to write one digit in each square for most written calculations though this is not advised when using all representations such as bar models.

Purple pens are used by the pupils when self marking, completing Strive Time challenges or providing feedback for the teacher to read.

Children are encouraged to present their Maths learning in their exercise books so that they can develop, present and apply secure models for calculation, reasoning and problem solving. This will include using pictorial representations such as part whole models and bar models.

Units of learning

For each unit of learning, following the 'Cold Maths', teachers will incorporate:

- Flexible use of the White Rose Maths Small Steps Guidance and related resources to present new materials in small steps.
- Vocabulary development related to the unit of Maths
- Concrete, pictorial and abstract methods to support deep understanding and facilitate reasoning and problem solving.
- Explicit instruction in key learning, with opportunities for stronger children to explore wider variation or intelligent practice
- Models and examples provided with clear steps to success. Models and learning recorded on the Working Wall to support children' learning.
- Opportunities for Maths Talk and Questioning
- Opportunities for children to check their understanding
- Scaffolding and support within each lesson with pre-teach, post-teach and planned interventions to support children as necessary.
- Opportunities to embed and practise skills in Maths lessons, morning challenges and throughout the day.
- Retrieval of prior learning including practice of key number facts for quick recall, calculations and mental Maths strategies. This might entail use of WRM Flashback Four (last lesson, last week, last term, last year).
- Strive Time to provide an opportunity to reflect on their learning and provide a learning challenge to move the learning on. This could be consolidation, scaffolding or further challenge.
- Weekly or fortnightly arithmetic practice using the Rising Starts Arithmetic Assessments or similar resources.
- Opportunities for all children to access complex or open-ended reasoning and problem solving tasks. Teaching of specific problem solving strategies for different 'Greater Depth' problem types.
- Opportunities to explore Maths in Outdoor Learning

Learning Outdoors

Learning Maths outdoors provides invaluable opportunity for children to be active, to develop and maintain their 'Can do' attitude to Maths. The environment is used to provide concrete opportunities for real life learning and children sometimes use outdoor

materials such as leaves and stones as concrete manipulatives. Learning outdoors promotes team work and communication allowing the children to develop their understanding of the Maths as well as being a diverse backdrop of applying Maths to different contexts and problem solving. This experiential approach, established in our EYFS learning, continues to support and motivate the children throughout the academy.

Formative Assessment and Feedback

At Jerry Clay Academy, feedback in Maths is provided to improve pupil learning and should target specific learning gaps.

NCETM, Marking and Evidence Guidance for Primary Mathematics, 2016 states:

Teacher's marking can provide extra feedback to support children's learning. However, the most important activity for teachers is the teaching itself, supported by the design and preparation of lessons.

At Jerry Clay Academy, we use efficient marking and evidence-recording strategies to allow teachers to prioritise lesson design and preparation.

Teachers use formative assessment to understand learning needs and high-quality teaching allows them to address the gaps. Feedback is then provided in an appropriate way and at an appropriate time to move the learning on. Children have opportunity to check their understanding and receive feedback regularly using a combination of partner talk, verbal feedback from their teacher or teaching assistant, self-marking and written marking.

In order to judge when to give the feedback, the teacher will consider the task, the individual need and the collective understanding of the class. Feedback should aim to move the learning forward and target specific learning gaps. A key factor in deciding on the timing and method of feedback is considering how children will receive and act on this feedback. Feedback could be:

- Reactive groupings to provide support and challenge,
- Further modelling, scaffolding or challenge
- Immediate / later in the lesson / next lesson
- Stop the class and address!

- Strive Time
- Provided in Morning tasks
- Planned into interventions – same day / next day / weekly
- Integrated into and inform planning for next and future lessons

Pupil to teacher feedback

Pupil to teacher feedback is even more important than teacher to pupil feedback as it allows the teacher to assess and provide for the pupil's next steps. Pupil to teacher feedback could be provided

- verbally during a Maths talk activity or through conversation with the pupil.
- Children could provide a traffic light or smiley face indication of their confidence
- Pupil could be invited to join a reactive grouping for further support or challenge.
- Following self marking, children may use their purple pen to provide a bubble annotation to explain their thinking, challenges they have overcome or if they made a 'marvellous mistake' to explain their misconception.

Written marking

Teachers should prioritise efficient methods of feedback to allow them to spend time on lesson design and preparation. When completing written marking, teachers or teaching assistants highlight slips with a dot. This written marking may take place during or after the lesson. Children self-correct their own slip and explain the mistake.

If the error demonstrates lack of understanding an alternative course of action will be identified which might include an intervention with the individual or group of children.

Teachers may provide a star or a wish

A * could praise progress or significant achievement by the individual.

A wish could provide support, consolidation or challenge that will move the pupil's learning on.

End of Unit Assessment

Following each unit, a 'Hot Maths' task is given, printed on Yellow paper, using the WRM End of Unit Assessments. (Year 1 assessments are delivered would be carried out as part of normal lesson learning tasks) Teachers keep records of individual children's performance across the unit and record their success in the Individual Pupil Progress Booklets.

Termly Assessment

At termly assessment points, the children complete the WRM Assessments (Paper 1 Arithmetic, Paper 2 – Reasoning and Problem Solving) Alongside other knowledge of the children's performance, these inform teacher judgement. Teachers use these assessments to identify gaps and plan for further retrieval and teaching in the following units.

Times tables

Children are taught times tables in class and work towards Diamond Dash Awards. The Diamond Dash levels align with year group expectations although in this, children are encouraged to progress as quickly as they can. At the end of the year 'Gold' and 'Platinum' winners compete in semi finals before the fastest group compete in the ultimate Diamond Dash challenge to win the trophy. Children also have access to Times Tables Rockstars to practise their times tables and there are regular 'Battles' in class to motivate the children.

Teachers use a range of strategies to ensure that concepts are secure. They then use different strategies to provide children with the opportunity to practice these facts.

Opportunities for learning online

Children are provided with logins for Times Tables Rockstars which allows them to practice rapid recall of their times tables. Teachers are able to manage the settings on these apps so that children are able to learn and be challenged at their own pace.

Supporting children with SEN

At Jerry Clay Academy, in Maths our curriculum is ambitious and designed to give all learners, including the those with SEND or high needs the knowledge and cultural capital they need to succeed. With the motto, MathsEveryoneCan, the White Rose Maths resources ensures that everyone can improve and succeed at maths through the sequenced progression of small steps. Using our knowledge of every child, we will use and adapt specific resources and evidence-based strategies to ensure that every learner has the resources to match their needs. Dependent on needs we will teach the same curriculum with additional strategies and resources to match their needs. For others we put in place ambitious targets for the children and measures to ensure these are met drawing on progression documents and assessments to identify gaps and provide the support needed for progress to be made. We are inclusive and encourage the teaching of one curriculum that works for all with support and challenge provided as needed. Strategies include:

<u>Scaffolding:</u>

- The Concrete, Pictorial, Abstract approach allows pupils to understand a concept through representations such as a ten frame, place value counters, base10/dienes, bead strings or cuisinaire. When modelling using these representations, the teacher will make it clear that these are available to access, support and stretch understanding later on.
- Steps to success are modelled on the working wall with clear steps to success that provide scaffolds for pupils to become confident with their learning.
- New material is presented in small steps and only proceeded from once mastered.
- Support for SEN children with learning using maths facts which may include using visual representations or flashcards.
- All scaffolding follows a 'I do, we do, you do' approach.

Explicit instruction:

- Teachers will give explicit instruction through worked examples and will model their thought processes in this to allow pupils the opportunity to practise this process afterwards.
- Pupils will be taught sentence stems and language structures to allow them to articulate processes and understanding
- Pupils will be given specific opportunities to practise specific skills that are barriers to learning
- Visual aids and concrete examples will be modelled using manipulatives by the teacher to embed and deepen understanding.

Cognitive and metacognitive strategies

- Tasks may be 'chunked' into smaller steps.
- Sentence stems and steps to success will be made visible to children to support independent work.
- Support may be given to avoid cognitive overload. So if the focus of the lesson is one area of understanding (for example calculating area of a rectangle by multiplying the length by the width, then providing the pupils with times tables grids where this is an obstacle will help them focus on the learning rather than struggling with the mechanics of the calculations.
- Memorisation of key facts and processes will be encouraged and supported through an ethos of repetition.
- Pupils will learn specific strategies for problem solving to give them the tools to apply their knowledge and skills in different contexts.
- Regular focus on marvellous mistakes allow pupils to spot, explain and rectify error and help teachers to identify and tackle misconceptions early on.
- Dependent on ability, children with SEN may be asked to evaluate their own learning and discuss what they need to do to move their learning forward.

Flexible Groups / Fading

- Temporary groups may be established to support learning in a particular concept
- Preteaching and support with key ideas before a topic is taught to increase confidence and participation.
- Identifying knowledge of precursors (indicators of what a pupil needs to have covered in order to access a step is essential so we incorporate revisting these before a topic is taught.

Use of technology

- Technology provides many useful resources for providing visual stimuli for the concrete and pictorial approach, allowing pupils to interact directly with material while learning concepts. These included interactive whiteboard resources as well as website such as numbots to reinforce visual representations of number.

- Times Tables Rockstars, One Minute Maths and Hit the Button are examples of website that allow the pupils to practise recall of facts, mastery of which enables pupils to be more confident in maths and reduces cognitive overload when calculating.

Impact

Children at Jerry Clay develop confidence and fluency in Maths which equip them to move on to the next stage of the education with the knowledge, skills and attributes they need to succeed. A high proportion of children consistently achieve expected standards in Maths and a higher proportion of children also achieve the higher standard at the end of KS2.

'Can do' Maths

Lessons show high levels of engagement and confidence with excellent learning to learn behaviours throughout the school.

Children routinely use Maths talk to explain their reasoning.

They enjoy practicing and mastering Maths skills and calculations

The children enjoy challenging themselves in Maths, whether it is to become more fluent with skills of Maths facts or to apply their Maths in a different context or problem.

They know that taking a risk and making a 'marvelous mistake' will help them to move their learning on.

The children take pride in neat presentation in Maths because the children know that organized, clear presentation allows them to be accurate, to follow their steps to success and to minimize the possibility of accidental errors.

The children know that they can look to their working wall for support with their learning and this helps them to become more confident and independent learning.

Children are supported to check and explain their own understanding and they know how to let their teacher know if they would like more support to move their learning on.

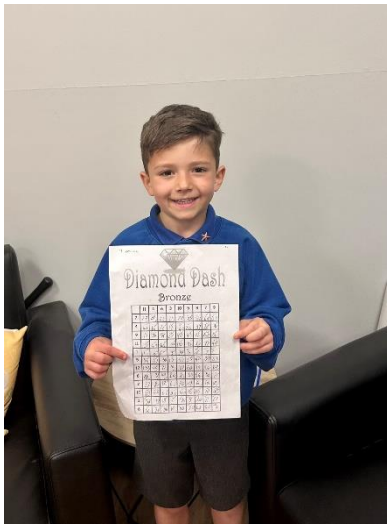
Formative assessment is used consistently in all lessons so that the children are supported to keep up not catch up. Gaps identified are addressed swiftly and there is a constant focus on consolidation and next steps in Strive Time and the lesson sequences.

Home learning during periods of self-isolation, bubble closures or lockdowns aligns with learning in school so that children are well supported to maintain their progress in Maths. Children receive feedback and support via the online platforms to continue to check understanding, address misconceptions and maintain confidence in Maths.

Celebrating Maths

Maths is something that is celebrated across school and children regularly share their Maths learning in assemblies including Special Mentions Assembly and with parents in ParentMails and Newsletters. Praise is given both for attainment and progress and to

attitudes to learning and use of the Learner Traits. Certificates for Diamond Dash are presented during Special Mentions Assembly.



Where to find evidence of the subject in school:
In every classroom from Year 1 to Year 6, there will be a set of Maths books in which children complete their work.
A Diamond Dash award chart is displayed in classrooms.
A Maths celebration display is situated outside the Year 4 classroom.
Photographs of teaching and learning in Maths is display on the Staff Shared drive in Academy Subject Evidence (Year) / Maths.
Planning may be viewed on Staff Shared / Academy Planning (Year)
Subject Evidence is saved Staff Shared / Academy Subject Evidence (Year)
Subject Leader Monitoring can be found in the Maths Subject Leadership File and is saved in Staff Shared / Academy Subject Leadership (Year)

Where to find resources in school:
White Rose Maths Scheme of Learning is saved on the Staff Shared / Academy Maths as well as the Calculation Policy, End of Unit and Termly Assessments and Flashback Four Retrieval Tasks.
These may also be accessed from the White Rose Maths website.

Staff shared / Academy Maths also contains the Diamond Dash materials and other useful teaching resources including:
DfE Ready to Progress Criteria and Year Group Guidance
NCETM Mastery Tasks,
I See Reasoning and other Reasoning and Problem Solving materials.

Copies of Rising Stars Arithmetic Assessments are available from the Maths Subject Leader.

A central supply of concrete Maths resources is situated in storage units outside the Year 4 classroom.
Classes have their own supplies of concrete resources. Contact the Maths subject leader if you require any additional resources.

Useful websites:
https://www.ncetm.org.uk (free individual registration. Access CPD resources)

https://whiteroseMaths.com/
https://classroomsecrets.co.uk/ (school login)
https://thirdspacelearning.com/ (free individual registration to access some resources

The Curriculum at Jerry Clay Academy

https://diagnosticquestions.com/
https://www.topmarks.co.uk/
https://ttrockstars.com

Mrs A Johnson

Maths Lead