

## Maths – Principles and Practice Updated May 2022

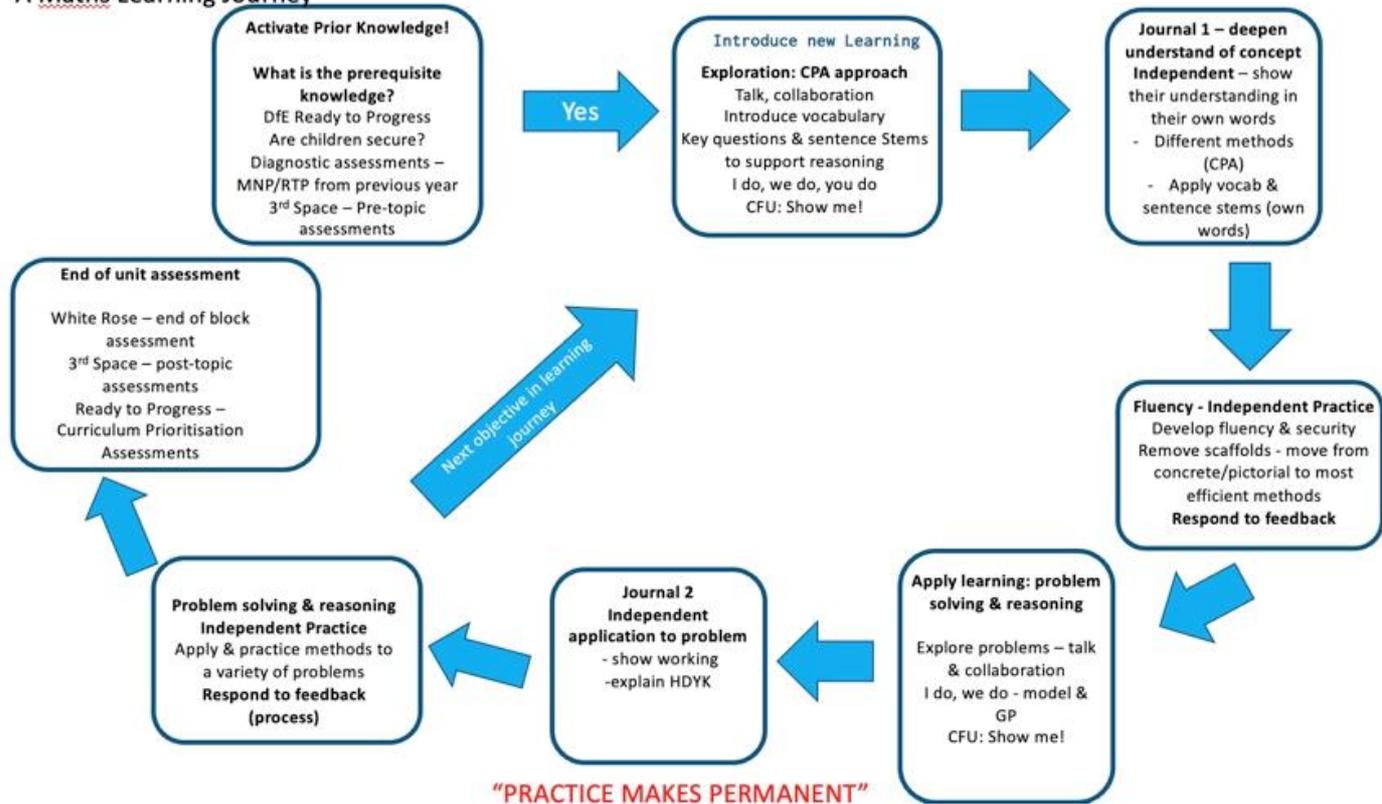
At Courthouse Green, our aim is to ensure that learners of every attainment level develop a deep and secure understanding of Maths. All children, from EYFS to Year 6, will be taught using a mastery curriculum, which develops conceptual understanding through a CPA approach. Pupils learn new concepts initially using concrete examples, such as counters, then progress to drawing pictorial representations before finally using more abstract symbols. Problem-solving and reasoning skills are taught throughout each learning sequence in order to develop metacognitive and higher-level thinking. Mathematical talk and communication are also at the heart of our curriculum with explicit teaching of mathematical vocabulary. Questioning and the use of sentence stems support children to explain their thinking verbally as well as recording in their journals. In order to retain key learning and develop fluency, key mathematical concepts are revisited regularly through daily practice and weekly arithmetic sessions.

All Maths teaching and learning at Courthouse Green will demonstrate the following principles:

- Majority of children work at broadly the same pace on the same content
- Mixed ability classes and seating plans – collaboration is key!
- Flexible groupings informed by AfL
- Concrete Pictorial Abstract
- Manipulatives available for all, with children moving swiftly to most efficient methods when ready
- A Learning Mindset promoted in every lesson – praise effort not achievement
- Language, communication and reasoning developed in every lesson – key vocabulary and sentence stems are displayed and explicitly taught
- Depersonalised e.g. *My friend thinks... Someone over there has suggested...*
- Emphasis on the process not the outcome
- All learning sequences develop fluency, problem solving & reasoning
- Challenge for all
- Key questions to check for understanding, develop reasoning and promote deeper thinking
- Clear learning journey and success criteria, with children mastering each small step

### A Mathematical Learning Journey

## A Maths Learning Journey



## Planning

Each year group’s planning can be found at <https://whiterosemaths.com/resources>

To ensure progression and curriculum coverage, teachers are expected to follow the White Rose yearly curriculum plan in its published order. However, teachers should use their knowledge of their class’s prior attainment, gaps in learning and key performance indicators to personalise the learning sequence and ensure good progress.

Before planning a unit of work, teachers should refer to the necessary pre-requisite skills outlined in DfE Mathematics guidance: key stages 1 and 2.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1017683/Maths\\_guidance\\_KS\\_1\\_and\\_2.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1017683/Maths_guidance_KS_1_and_2.pdf)

To ensure pre-requisite skills are secure and to activate prior knowledge, each unit of work will start with a diagnostic assessment of the previous year group’s learning. Teachers will use this information to inform and adapt the next unit of work.

Every stage of the learning journey will follow the ‘I do, we do, you’ structure. Teachers will model a variety of methods, including modelling their thought processes. Learning will then be reinforced through regular opportunities for guided practice with a partner or teacher, including the use of scaffolds such as worked examples. Finally, learning is secured through independent practice to develop fluency and automaticity. At this stage, scaffolds should be removed whenever possible to encourage effortful retrieval and the securing of skills to the long-term memory. Pupils will receive feedback at each stage of the learning journey, with the opportunity to reflect on and evaluate their learning. Where possible, independent tasks will be uploaded on to Showbie for children to complete independently in their maths journal, avoiding printing and sticking paper in books.

## Questioning

Key questions for each lesson are given in the teacher notes section on <https://whiterosemaths.com/resources>. However, teachers are expected to plan differentiated levels of questions to support, challenge and extend all learners’ understanding.

**Level 1 questions** should help all learners achieve the lesson objective with support. Consider what the barriers to learning might be and how resources could be used to support. *E.g., My friend says that the squares inside*

*the shape might help you to find the area. What do you think? MFS I could use place value coins to help me solve this problem. How could she do that?*

**Level 2 questions** should help learners **achieve the lesson objective at an age-related expectation**. Consider the main objective of the lesson and the mathematical understanding behind it. *E.g., MFS they can see rectangles, how can this help? MFS you could use the length of the sides and then you wouldn't need to count the squares – what does she mean? MFS she would add the digit in the ones column first. Why would she do that?* The majority of planned questions should be Level 2 to ensure depth in understanding of the main objective.

**Level 3 questions** should challenge and extend the thinking of learners who may already understand the lesson objective or show a good understanding within the lesson. Their purpose is to add depth and variety to the same problem. Consider how to ignite learners' curiosity and challenge prior knowledge. *E.g. How many different ways are there to solve this problem – which is most efficient? MFS it's possible to make a shape with the same area and perimeter – do you agree? Can you explain why... Does this work for all .....? Can you imagine what would happen if ....? How is your answer/strategy/method different/ similar to...?*

Level 1, 2 & 3 questions should be planned and written on the presenter notes of the relevant keynote pages and shared with all teachers and LSAs. LSAs will be expected to use the same key questions to target identified children or groups.

**Mathematical vocabulary:** Key vocabulary for each unit is shown in the teacher notes in each scheme of learning. This is to be displayed in classrooms on Maths learning walls and referred to throughout the unit of work. Vocabulary specific to each lesson must be displayed on presenter keynotes and explicitly taught during each lesson. Sentence stems will be planned and taught to assist children with mathematical reasoning and correct use of mathematical vocabulary. These will be displayed on keynotes and rehearsed orally with the expectation that children use when talking to their partner, the class and in their journals.

### **Journaling**

At regular points throughout a learning sequence, children will independently show their understanding of a skill or concept by recording their thinking in their Maths book – journaling. In journals, children are presented with a problem and asked to record their responses in different ways e.g., pictures, diagrams, calculations, or written responses. Journal entries should be individual, independent and should not be perfect! Expressing themselves like this develops children's mathematical language and helps them verbalise their thinking. Children should be asked to journal after they have been taught a concept, so they feel confident to explain, convince and justify their response. This provides a clear assessment opportunity for teachers.

### **Supporting HA and LA learners**

In a mastery curriculum, it is expected that the vast majority of learners will progress through the curriculum at broadly the same pace. However, every class will have a range of learners with varying prior attainment – novice to expert – and all learners should be supported to make progress. A range of strategies should be used to ensure that all children secure the learning and make progress.

#### **Lower attaining learners:**

- use concrete and pictorial scaffolds for as long as needed to build confidence & fluency
- plan & ask level 1 questions
- pre-teach vocabulary and use of concrete resources
- sentence stems to support reasoning
- photos & voice notes to record journaling
- select procedural questions from workbook pages – chose focus questions & provide further examples to embed skill
- build fluency before journaling, problem solving & reasoning
- choose most appropriate method & overlearn rather record in a variety of ways
- worked examples & backward fading
- additional guided practice (we do) before independent practice (I do)

## Higher attaining learners

- plan & ask L3 questions
- detailed reasoning, moving towards generalisations – do they notice any patterns or links with previous learning?
- more independent work applying learning to reasoning & problem solving (see lesson notes) – chose which questions to focus on from workbook pages
- When journaling, show how to solve in all possible ways – which method do they prefer, which is most efficient?
- Can they write their own problem using the same concept? Ask.... What if...?
- I See Reasoning challenge
- Mastery & mastery at greater depth document

## Marking and Feedback

At Courthouse Green, we recognise that feedback is an integral part of the Maths learning sequence. Its purpose is to further a child's learning and provide information to the teacher on the next stage of learning. Feedback must empower a child to take responsibility for improving their own work, with the onus on children to correct their own work rather than having correct answers provided for them. Teachers will make professional judgements about when is the right time to intervene and which method of feedback will have the greatest impact. Effective feedback in maths lessons could be in the form of:

- Children self-marking calculations and fixing any corrections – time is set aside for this within lessons
- Whole class feedback on strategies used to problem solve
- A focus assessment question for teachers to mark thoroughly
- Marking or verbal feedback of **independent** journal entries
- Verbal feedback to individuals or groups within lessons
- Whole class feedback at the start of the next lesson to address misconceptions

Where children have achieved the learning intention, the WALT will be pink as an acknowledgement from the teacher. Any section of the work that the teacher would like the children to have another go at, will be highlighted in green – this may include a scaffold or worked example to help them succeed.

## Additional Maths Provision – Developing Fluency

All year groups will begin the day with a 10-minute Early Bird Maths session. Children will be given a selection of arithmetic questions, which focus on rehearsal of key skills. Teachers may also choose to use this session to revisit prior learning from earlier in the year. Early Bird Maths is uploaded on to Showbie and marked after the register/at the start of Maths lessons.

Resources to support Early Bird Maths

- Flashback 4 ([www.whiterose.com](http://www.whiterose.com))
- Fluent in 5 (3<sup>rd</sup> Space Learning)
- Primary 5-a-day (Corbett Maths)
- <https://myminimaths.co.uk/>

An additional 10-15 mins per day of number fluency is planned for each year group. For KS1, this will focus on number bonds to 10 and then 20 e.g. Mastering Number or Number Sense Maths.

Year 3 – Number Sense Maths (Autumn Term) Multiplication tables rehearsal (Spring & Summer Term)

Years 4 to 6 – Multiplication tables rehearsal

Years 4 to 6 will also timetable a weekly 40-minute arithmetic lesson (PPA slot)

## Assessment

Opportunities for independent application of key skills is built in throughout the learning sequence. Teachers use their AfL to inform the next lesson and future units of work.

**End of unit assessment:** At the end of each unit, all children will independently complete an end of unit assessment. These can be found at <https://whiterosemaths.com/resources>. This will identify which children are on track to achieve ARE by the end of the year. It will also identify children who require intervention to 'keep up' within the year group. If a small group of children are not secure with a key skill from the chapter, this can be the intervention focus for the next half term. If many children are not secure with a key skill from the chapter, this will need re-visiting for the year group. The end of unit assessments will be used to monitor progress of all children, particularly those being targeted to reach ARE. The outcomes of assessments will inform planning, interventions, and pupil progress meetings.

**Formal assessment:** During end of term assessment weeks, children will be assessed against the key concepts for their year group (Ready to Progress Criteria). Ready to Progress assessments can be found at: <https://www.ncetm.org.uk/classroom-resources>