

Subject Area: Carol Porter

Subject Leader: Mathematics

What is the aim of your curriculum?

Our curriculum aim is to empower children to believe that “Everyone can do Mathematics! Everyone can!”. We use White Rose Mathematics along with the statutory outcomes published from Herts for Learning (HFL) in line with the National Curriculum. We share the belief that our mathematics helps to create assured, happy and resilient mathematicians who relish the challenge of mathematics. They become independent, reflective thinkers, whose skills not only liberate them in mathematics but also support them in all areas of their learning and development. Within the EYFS curriculum mathematics is one of the seven areas of learning and taught daily. In EYFS children will focus on counting, identifying, representing and estimating numbers, reading and writing numbers, comparing and ordering numbers and children explore the composition of numbers to 10. Using WRM we deliver an inspiring and ambitious mathematics curriculum, rich in skills and knowledge, which ignites children’s curiosity and prepares them to develop inquiring minds and confidence with number and mathematical concepts. We want our children to have a growth mindset approach to mathematics and a confidence to reason and problem solve.

We complement our daily mathematics lessons in Years 1-4 with mathematics fluency lessons using NCETM materials (EYFS, Key Stage 1) and Herts for Learning fluency package (Years LKS2). The children in Reception access the NCETM models within their maths lessons.

The intent

Mathematics is essential to everyday life, critical for science, technology and engineering for supports financial literacy as children grow into adulthood. A sound understanding of mathematics is vital for young children becoming independent. Children develop reasoning and problem-solving skills which will be used as they progress from childhood to adulthood.

Pupils will move **fluently** between **different representations** of mathematical ideas. They will develop **fluency** in number facts, develop conceptual understanding, develop rapid recall of facts, and apply their knowledge rapidly and accurately.

Children will **reason** mathematically and begin to follow a line of enquiry and “prove it” using mathematical language and manipulatives. Children will be confident to say what an answer can’t be as well as what it could be.

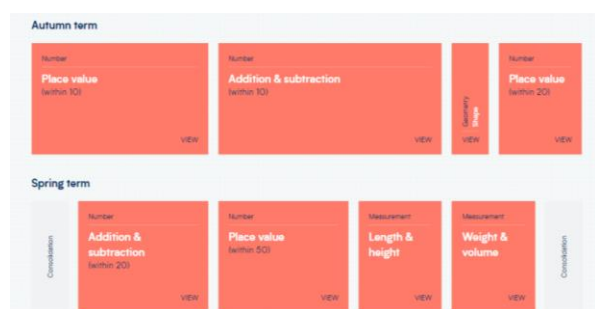
Children will **solve problems** and begin to break down mathematical problems into simpler steps to find a solution and “prove it”.

We use a **mastery** approach to teaching mathematics where children think mathematically, develop their fluency facts and number facts, begin to think differently and make connections in their mathematical learning.

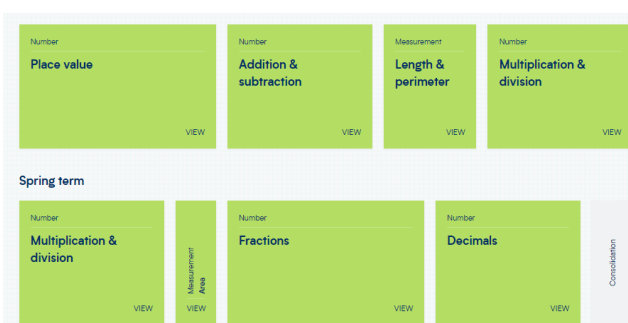
The implementation

At Barley Bark way Federation we use White Rose Mathematics (WRM) as a scheme of learning. WRM is a sequential, blocked scheme, which allows for depth and breadth of learning within each strand of mathematics. Each term the blocks of learning are built upon with some (R) recovery learning. We are committed to developing a Mastery approach to teaching and two designated teachers are enrolled on the Mastery Development Programme with the NCETM Maths Hubs. We also teach the NCETM and Maths Hubs Mastering Number fluency programme within Reception, Year 1 and Year 2.

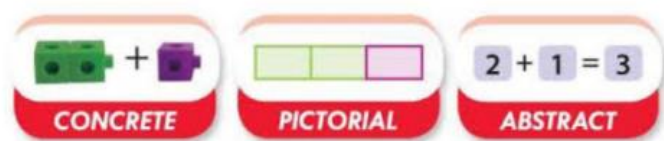
Year 1



Year 4



WRM follows the **Concrete, Pictorial and Abstract (CPA)** approach to learning which



supports mastery in mathematics. **ALL** children will use a range of **manipulatives** when working at the **Concrete (C) level**, **draw** their learning at the **Pictorial (P)** level and write or answer **standard mathematics**

calculations at the **abstract level (A)**. Within one lesson you MAY see all CPA in action with children working at their own level on the same concept. CPA is not just for children with **SEND**. In our Federation children will be exposed to the use of manipulatives, learn how to use them and have confidence to use them in their independent learning. Manipulatives strengthen teaching and learning of mathematics from Reception to Year 4. This knowledge supports children to take ownership of their own “preferred method or manipulative” to use based on the modelling from the teacher. As an example, some children are more confident in using dienes while other children prefer to use place value

counters. Teachers model the “how to” so that children are confident to “prove it” in their mathematics learning.

Mathematical vocabulary is key to securing mathematical understanding. Teachers model the use of mathematics sentence stems to encourage children to communicate their ideas in mathematics. Lessons frequently commence with a problem solving and reasoning activity to develop the use of mathematical language and answer mathematical questions. Children might use the language of “I know that ... I proved that .. I know it can’t be ...”. This gives the opportunity for children to implement their mathematical vocabulary in their mathematics book by writing mathematic sentences to prove their conceptual understanding.

WRM and the NCETM maths materials are used in the **EYFS** alongside the **Montessori** approach to teaching and learning. In the EYFS the team provide creative and engaging opportunities for children to learn about mathematics with frequent and varied learning experiences which allow children to build on and apply their knowledge. In the mathematics lesson children use manipulatives including tens frames and part, part whole models. In the EYFS **inside and outside learning environment** children may use sand and water to develop their understanding of capacity and measurement and use non-standard units of measurement to measure toys and pictures. In the EYFS mathematical learning is embedded in children’s play alongside a solid understanding in number.

The impact

At Barley Barkway Federation the expectation in mathematics is that most children will move through the programme of study at broadly the same pace using the Mastery approach to mathematics accessing the CPA model. Some children may have their learning adjusted to support their progress and development. Some of our children who have SEND may have an individualised curriculum to meet the outcomes of their Education Health and Care Plans (EHCPs). All children follow WRM making progress in mathematics from their starting points.

The impact of WRM is that children build on yearly objectives and develop their mathematical ability and understanding as they progress through the curriculum. Decisions about when to progress will be based on the security and readiness of the children to progress to the next stage. Pupils who grasp concepts rapidly can be challenged through problem solving and reasoning activity to consolidate their learning while some children may be working practically at the concrete level to develop their understanding. Some children may require additional consolidation and teachers will plan for additional practice or intervention. This may involve same day interventions or an episode of support for a mathematical concept.

Formative assessment is conducted within each lesson, **verbal feedback** is given to children within the lesson and using **marking symbols**. **Summative assessment** is completed using **end of block WRM assessments**. Teachers assess the use of sentence stems and mathematical vocabulary within children's oral and written learning.

Mathletics is used in years 2-4 as a **formative assessment** tool alongside WRM and aligns to the WRM curriculum. The children in year 2 will be introduced to Mathletics once their skills have developed to use IPADs and access software programs. Mathletics may be used to support intervention alongside other fun and engaging maths programs such as TOPMARKS, Number Sharks (dienes) on ICT games.

White Rose Maths 1-minute activities (app) are used by children in year 1 and modelled in Reception to consolidate learning of subitising. It is a tool to rehearse learning that has taken place within mathematics lessons.

What are your subject's Strengths/areas to development –

Strengths

- Children have the same opportunities to learn and grasp concepts (implementation).
- Fluency will support rapid recall of number facts (impact).
- NCETM Maths Hubs training with designated teachers undertaking training and disseminating current pedagogy.
- CPA and Mastery supports all children and WRM summative assessment supports future planning and intervention needs (3 Is).
- Mathematics is fun and engaging with opportunities to develop mathematical language and vocabulary (3 impact).

Areas to develop

- Embed fluency lessons 3 times a week across the federation and assess impact year on year (implementation, impact).
- Embed a mastery approach to mathematics in all classrooms (NCETM project & implementation)
- Ensure all children are confident in the use of manipulatives with manipulatives available for all children and not just children with additional needs (3 Is).

How is mathematics monitored?

Regular monitoring takes place through lesson observations, book looks and pupil voice. Feedback is given to teaching staff. Staff meetings are planned to discuss mathematics, carry out training, model new training and we work with the mathematics team at Herts for Learning to keep our knowledge and skills up to date.

Fluency takes place three times a week outside of a maths lesson. The impact is that children will have a fluent recall of number facts. This commenced in Summer 2021 and teachers are reporting positive conceptual understanding for most children. This will be monitored year on year to assess implementation and impact.

How is mathematics taught in the EYFS?

Children use mathematics in the learning environment. In EYFS children will focus on counting, identifying, representing and estimating numbers, reading and writing numbers, comparing and ordering numbers and children explore the composition of numbers to 10. WRM and Montessori is used in the EYFS alongside with an engaging and creative learning environment set up and planned for by the practitioners.

Mathematics is one of the Early Learning goals for the end of the Reception year.

Children at the expected level of development will have a deep understanding of number to 10, including the composition of each number, subitise (recognise quantities without counting) up to 5, automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10.

Children at the expected level will verbally count beyond 20, recognise counting patterns and compare quantities up to 10 as well as recognise greater than, less than or the same when looking at quantities. Children will begin their fluency journey learning about number bonds and double facts.

How are SEND and PP children supported in mathematics?

Manipulatives are for all children and not just for children with SEND. As an example, we support children with their reading as this may be a barrier to a maths skill. Children are not categorised but additional support is in place where required with Quality First Teaching (QFT) and intervention.

Some children will work with an adult in a small group to support their attention and concentration and security to follow an instruction. Teachers can record use of mathematical vocabulary and make adaptations as required.

Pupils with Education, Health and Care Plans (EHCPs) who have statutory outcomes and provision relating to maths may follow an individualised curriculum.

Addition provision is in place using our support staff and this may include pre-teaching, support children with misconceptions through timely or same day intervention and opportunities to consolidate learning. Quality first teaching (QFT) in the classroom is embedded as all staff have a responsibility to plan for all children including children with additional needs, make adaptations and challenge them to make steps of progress from their starting points.