

Mathematics Policy

CAPTAIN WEBB PRIMARY SCHOOL

Curriculum

Weston, Nicola

Date: 1st October 2023

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Intent

At Captain Webb Primary School, our overarching principle about learning is: 'Knowing more and Remembering more'. We have designed our curriculum so that more time is given to embed key knowledge, make connections and be ready for the next stage of a child's learning journey. Through their growing knowledge and understanding, we aim to make all our children confident and competent mathematicians, who can make links in their maths learning to other areas of the curriculum.



We aim to provide the pupils with a challenging mathematics curriculum and high-quality teaching to produce individuals who are numerate, creative, independent, inquisitive, enquiring and confident. We also aim to provide a stimulating environment and adequate resources so that pupils can develop their mathematical skills to the full.

Through our well-planned maths learning journeys, we provide opportunities which cater for the needs of all individuals and empowers them with the necessary skills and knowledge to become successful in their future adventures. We incorporate sustained levels of challenge through varied and high-quality activities and ensure that children are on track at each stage of their education in fluency, reasoning and problem solving. Thus, in turn will prepare them for the next stage of their education and a successful working life.

Implementation

Our knowledge-based curriculum plans for success. Through small, well planned steps (as outlined in our medium term plans) new mathematical concepts are introduced using a '**Concrete, Pictorial and Abstract**' approach. This enables all children to experience hands-on learning when discovering new mathematical knowledge and allows them to have clear models and images to aid their understanding.

The **Concrete-Pictorial-Abstract model** also allows children to build on their knowledge of key concepts in small steps and allows all learners to keep up with the curriculum demands.

This approach to Maths is reflected in our calculation policy and pedagogy with Teachers modelling and exploring key knowledge through the I-We-YOU approach.

At Captain Webb we have a well-planned curriculum that is inclusive and ambitious. Through declarative, procedural and conceptual knowledge, teacher's use a curriculum engineered by the National Curriculum and White Rose to ensure that children are exposed to mathematical knowledge and concepts which will prepare them for their next stage in education.

In EYFS, Key Stage 1 and Key Stage 2 Maths is taught on a daily basis.

In each aspect of the Maths Curriculum and throughout each key phase, the children embark on a contextualised mathematical journey. This ensures that there is breadth and depth to the curriculum offer.

Each journey consists of the following:

- 1) **Activating Prior Knowledge**
Use of a variety of assessments to revisit and build on pupils' existing knowledge and understanding.
- 2) **Instruction**
Use of well-planned manipulatives and representations which the children can then draw upon independently in the future. (See Jottings Policy)
- 3) **Modelling of strategies**
The teaching of methods and procedures in order for the children to solve calculations in preparation for reasoning and problem solving (See Calculation Policy).
- 4) **Guided Practice.**
Opportunities for the children to make connections between mathematical facts, procedures and concepts, thus developing a rich network of mathematical knowledge.
- 5) **Independent Practice.**
The development of independence and motivation in order to develop metacognition-the ability to independently plan, monitor and evaluate their thinking and learning.
- 6) **Structured reflection**
The use of contextualised tasks and resources which challenge and support pupils' mathematics; deepening their thinking with models of proof and conjectures.

Through our creative curriculum approach, we also seek to explore and utilise further opportunities to use and apply mathematics across all subject areas which is promoted during our Theme work in the afternoon.

Early Years

The 2017 Bold Beginnings Report raised the profile of early maths stating the need for there to be a system in place similar to phonics. It is widely accepted that early acquisition of core maths facts is a significant indication of future success. In reflection of

this, Numbersense was introduced in Reception in September 2023. This program is reflective of phonics and its rigorous and repetitive approach ensures children retain knowledge in order for them to move on to the next stage of their learning.

The curriculum in Early years focuses on depth over breadth. Pupils are encouraged to develop their Problem Solving, Reasoning and fluency in a broad range of contexts in which they can explore, learn, enjoy, practise, discuss and extend their skills. Pupils are encouraged to exploit their mathematical potential in both indoor and outdoor enabling environments. They are provided with a wide range of activities that promote regular active participation, exploration of real-life problems, development of imaginative play and early experience of mathematical language. All pupils are supported positively and encouraged to gain confidence and competence in their skills.

It is essential that children leave Early Years with a strong sense of number so that children are ready for the Year 1 curriculum.

This is achieved through:

- A sequenced, progressive learning journey.
- Ensuring children are immersed in maths so that times like snack time and play are incidental opportunities to revisit knowledge.
- Planning activities are in place with a clear intent for each session.
- Ensuring independent activities consolidate prior learning or pre-teaching concepts to come.
- Parental engagement and opportunities for families/carers to engage in the curriculum both in school and at home.
- Enquiry based sessions which embedded through play.

Key Stages 1 and 2

The scope of our curriculum design ensures that:

- There are systematic opportunities for retrieval, practice and overlearning.
- The learning journey allows children to practice and revisit key knowledge (as stated in our progression documents).
- Children revisit to the point of automaticity.
- Testing secures facts and methods into the long-term memory.

Planning for Success

Declarative Knowledge.



Declarative knowledge (fluency) is taught daily so that pupils know useful facts and formulae and develop an understanding of relationships and familiar patterns.

Every child's maths learning journeys start with revisiting previous knowledge in order to make connections with the new knowledge to be taught. Sufficient time and resources allow children to gain knowledge and be able to retain key information at this stage.



Procedural knowledge

Procedural knowledge is the teaching of procedures and algorithms and is a fundamental part of the learning journey. The school has a clear calculation policy which ensures that there is a reliable, accurate and consistent forward projecting approach. This stage of the learning journey enables our pupils to process mathematical information accurately and at speed.



Conceptual Knowledge

At this stage, the children will know a combination of methods and facts in order to be exposed to a variety of problems and reasoning. These are taught using the variation model so that the children are exposed to a strategy and can over learn this in order to have a get way into solving a range of challenging, rich and sophisticated problems



Practice

A core element of our curriculum design is to allow children sufficient time to practice to the point of automaticity. Practice and revisiting of key knowledge is completed daily as part of morning activities; during our KIRF time (Key Instant Recall Facts) where children focus on knowing key facts in order to be able to access the curriculum and be fluent in key skills and in lesson time.



Assessment

NCETM states that: 'If a pupil fails to grasp a concept or procedure, then this needs to be identified quickly and gaps in understanding addressed systematically to prevent them falling behind.' In reflection of this, assessment grids of non-negotiables are used to ascertain what must be known at this point to stay on the long term trajectory.



Success

Children can identify and talk about their success against the targets given to them at the start of the unit. These are then shared with parents along with next steps.

The Use of Knowledge Grids

At Captain Webb we have introduced the use of knowledge organisers to support children in their lessons and at home. These have proved a valuable tool in making children resourceful and independent learners. This is because:

- The knowledge organisers include judiciously selected tier 2 and tier 3 vocabulary. This vocabulary will be taught explicitly to students.
- The knowledge organisers incorporate the building blocks for learning in that subject that all students are entitled to know and understand.
- The knowledge organisers are designed to aid retrieval practice and metacognitive learning.

Here are some examples of the knowledge organisers that we are currently using in different areas in maths:

Number and Place Value		Knowledge Organiser	
Key Vocabulary	Counting		
thousands	Counting in 6s		
hundreds	Counting in 7s		
tens	Counting in 9s		
ones	Counting in 25s		
zero	Counting in 1000s		
place value	Compare and Order		
greater than	1000 More or 1000 Less		
less than			
order			
round			
rounded to			
negative number			
partition			
digit			
Roman numeral			

Converting Units		Knowledge Organiser	
Key Vocabulary	Converting Mass		Converting Capacity
mass	1000g = 1kg		1000ml = 1 litre
gram	$\frac{1}{10}$ kg = 0.1kg = 100g		$\frac{1}{10}$ l = 0.1l = 100ml
kilogram	$\frac{1}{4}$ kg = 0.25kg = 250g		$\frac{1}{4}$ l = 0.25l = 250ml
capacity	$\frac{1}{2}$ kg = 0.5kg = 500g		$\frac{1}{2}$ l = 0.5l = 500ml
volume	$\frac{1}{5}$ kg = 0.75kg = 750g		$\frac{1}{4}$ l = 0.75l = 750ml
millilitre	Converting Length		
centilitre	km $\xrightarrow{\times 1000}$ m $\xrightarrow{\times 100}$ cm $\xrightarrow{\times 10}$ mm		
litre	m $\xrightarrow{\div 1000}$ km $\xrightarrow{\div 100}$ cm $\xrightarrow{\div 10}$ mm		
millimetre	cm $\xrightarrow{\div 10}$ mm $\xrightarrow{\div 100}$ cm $\xrightarrow{\div 1000}$ m		
centimetre	mm $\xrightarrow{\div 10}$ cm $\xrightarrow{\div 1000}$ m		
kilometre	1000 metres = 1 kilometre $\frac{1}{4}$ km = 0.25km = 250m		
	100cm = 1m $\frac{1}{2}$ km = 0.5km = 500m		

We are very aware that knowledge organisers by themselves are fairly meaningless; it is how they are used for planning, teaching and retrieving previous learning that will have the intended positive impact on our pupils' outcomes, experiences and future opportunities.

The pupils can access their maths knowledge organisers at any time to help in maths lessons, homework or when maths occurs in other areas of the curriculum.. The use of organisers means that students have a scaffold in place for when they are working outside of the classroom.

Our use of knowledge organisers is a journey and one in which we have only taken the first few steps. To move forward we will:

1. Talk to pupils and make them a greater part of the knowledge organiser dialogue in our school. In particular, we want our children to have a secure understanding of how knowledge organisers work to support retrieval practice and vocabulary instruction, where they can find them and how they can use them for effective learning outside of the classroom, for example self-quizzing.
2. Make knowledge organisers accessible for parents and carers via our website and through making them a key component of conversations at upcoming parents' evenings.

Impact

Mathematics is an important creative discipline that helps children to understand and change the world.

This is supported by the opportunities we provide to develop cultural capital. We do this across the curriculum and throughout the school by:

- Organising events such as STEM Week and NSPCC Number Day, allowing pupils to apply their knowledge and skills to cross-curricular concepts or topics.
- Working with global companies such as HSBC to promote financial skills for work, learning and life.
- Giving children the opportunity to use money in real-life contexts (having spending money on trips or going to the local sweet shop in Year 2)
- Our contextual activities in maths at the end of each unit link to a real-life context which gives children a clear understanding of the importance and purpose of mathematical skills.
- Year 6 undertake an Enterprise project which gives them the opportunity to work with a budget; plan, design and make a product; market a product; engage in the selling process and finally, calculate and understand the importance of profit..