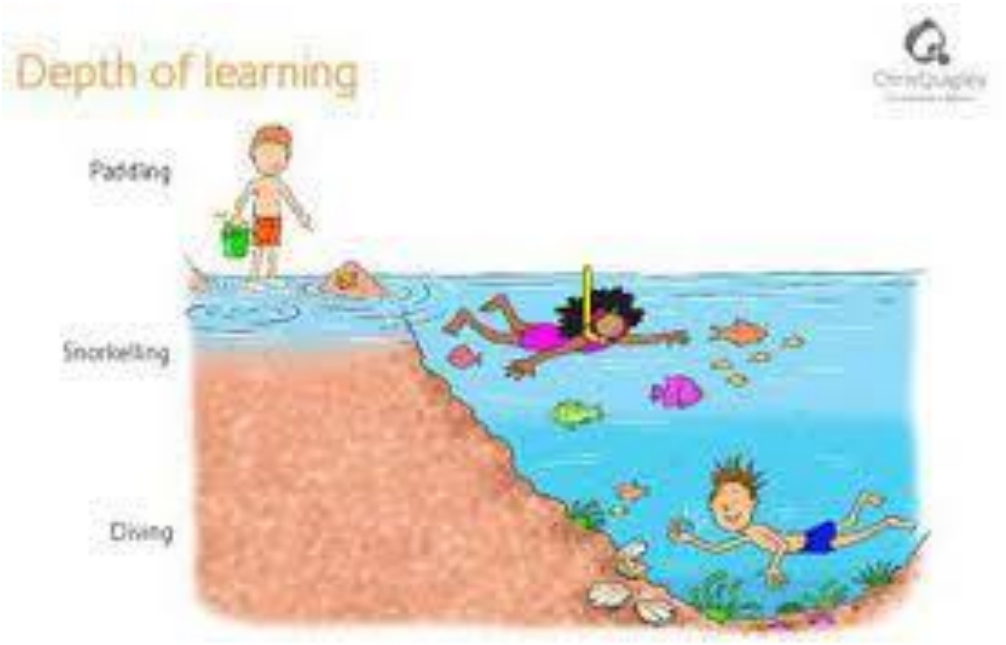
Intent, Implementation and Impact

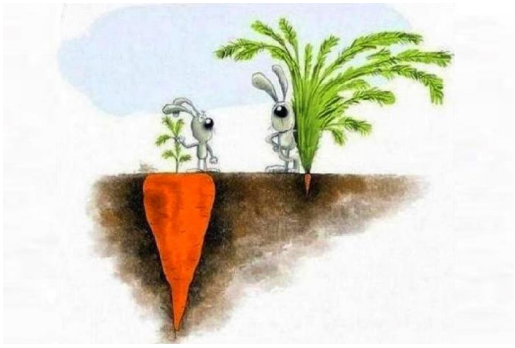
Intent

Maths is a journey and long-term goal, achieved through exploration, clarification, practice and application over time. At each stage of learning, children should be able to demonstrate a deep, conceptual understanding of the topic and be able to build on this over time. This needs to happen by making maths as engaging and accessible as possible by the careful planning and skilful teaching of lessons. **Every** lesson counts.

There are 3 levels of learning:

- ***Shallow*** learning: surface, temporary, often lost
- ***Deep*** learning: it sticks, can be recalled and used
- ***Deepest*** learning: can be transferred and applied in different contexts





The deep and deepest levels are what we are aiming for by teaching maths using the Mastery approach. However, it is vital to ensure that maths has solid foundations.

We intend to do this by:

- Ensuring our children have access to a high quality maths curriculum that is both challenging and enjoyable.
- Providing our children with a variety of mathematical opportunities, which will enable them to make the connections in learning needed to enjoy greater depth in learning.
- Ensuring children are confident mathematicians who are not afraid to take risks.
- Fully develop independent learners with inquisitive minds who have secure mathematical foundations and an interest in self-improvement
- Providing high-quality teaching which engages pupils

Implementation

Our implementation is developed through secure understanding of the curriculum and subject area.

In EYFS, maths is taught in an integrated way through the "Development Matters" programme.

In KS1 and KS2, maths is taught according to the National Curriculum programmes of study.

In order to deliver the maths curriculum, we use the Power Maths scheme. This contains plans and resources which have been developed to reflect the updated National Curriculum in 2014. Power Maths uses principles which help to deepen learning, as outlined in the "intent" section. It also ensures coverage of the whole curriculum. Power Maths used many of the principles of the White Rose scheme, which was used by the Federation in 2021-2022.

Power Maths has a set of calculations policies which are used to support teaching.

The "***concrete, pictorial and abstract"*** concept is a key feature which underpins the Power Maths approach:

Objects, pictures, words, numbers and symbols are everywhere. The mastery approach incorporates all of these to help children explore and demonstrate mathematical ideas, enrich their learning experience and deepen understanding. Together, these elements help cement knowledge so pupils truly understand what they've learnt.

All pupils, when introduced to a key new concept, should have the opportunity to build competency in this topic by taking this approach. Pupils are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols.

Concrete – children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing.

Pictorial – children then build on this concrete approach by using pictorial representations, which can then be used to reason and solve problems.

Abstract – With the foundations firmly laid, children can move to an abstract approach using numbers and key concepts with confidence.

In the appendices to this document, exemplification of the different representations of calculations are shown.

Teachers receive regular training on the delivery of the curriculum and also the elements of effective teaching. We use **NCETM** (National Centre for Excellence in Teaching Mathematics) to support teachers with subject knowledge and key up-to-date thinking and research for the effective teaching of maths. The NCETM "spines" also provide additional representations and subject knowledge for teachers.

Planning

Long term: We follow the maths programmes of study as set out in the 2014 National Curriculum document.

Medium term: Yearly overviews, which are provided by Power Maths. These are broken down into blocks of teaching, which are mapped across the academic year. Within each block plan, there is a breakdown of the recommended teaching sequence.

Short term: From the block units, a weekly teaching sequence is planned which contains:

- Learning intentions
- Starter activities (quick mental recall and mental fluency). The “Power Up” activities can be used for this.
- Main lesson content including challenge for those learners who are ready to learn in more depth.
- Use of adult support and other resources

Lessons are taught in line with the federation's teaching and learning policy.
However, we use some elements from ***Barack Rosenshine's "Principles of Instruction"*** (see appendix), which has a heavy focus on clear modelling, recap of key skills previously taught and opportunities to practise skills taught in order to rapidly embed them.

AFL (Assessment for Learning, also known as formative assessment) is also key, as this provides information to the teacher of the level and depth of understanding, which can inform a teacher's next steps or lesson planning. It is vital that teaching is adapted to meet the needs of the children within each classroom. We see mistakes and misconceptions as good things, because we learn best from them, especially when they are corrected and overcome by skilful and incisive teaching.

Lesson adaptations are an essential part of the teaching process.

Planning is routinely monitored by school leaders.

For children who have SEND, it is acknowledged that even with differentiation and support, they may have difficulties in accessing the curriculum. For these children, additional support will be provided or they will be given access to learning opportunities more suited to their level. This will be done in conjunction and liaison with the inclusion lead. For some children, focused adult intervention / pre-teaching in small groups or on a one-to-one basis may be provided.

Teaching / Individual Lessons

Maths is taught daily, with lessons from reception to year 6 lasting an hour.

Irrespective of the scheme which is used, it is **Quality First Teaching** which has the greatest impact upon pupil outcomes. This also needs to be backed up with excellent subject knowledge on the part of the teacher. This will be underpinned by the federation's teaching and learning policy. However, some key areas which are more pertinent to maths lessons are listed below:

- Lessons must be engaging, challenging yet accessible for all pupils. Children should not be limited from accessing greater challenge due to pre-determined class groupings. In fact, research has shown that mixed-ability groups are more effective for children of all ability levels.

- The key part of teaching mastery in maths is that children need to understand the concepts behind the mats, rather than being taught in a procedural way. It is also important to make sure that skills are embedded and deepened, rather than glossed over. It is better to explore the depths of one pool rather than the surfaces of many.

- Despite the over-arching scheme of Power Maths, lessons will be bespoke and tailored to the needs of the cohort being taught. A lesson may work one year, but this does not mean that it will the next.

• Clear modelling is vital in all lessons. Success criteria should also be clear, and where possible generated within the lesson with the pupils. It is vital that the children know "what makes good", and how to get to it. We adopt the "my turn, together, your turn" approach where the teacher models, the pupils attempt ti with the teacher, then the pupils try it independently or with their partner/

• Targeted questions used to elicit effective responses and to enable AFL to take place. Refer to the appendices ***"AFL - Questions Worth Asking"*** and ***"Quality Questions for Thoughtful Answers"*** for further information. We accept that asking children to put up hands has a use in terms of gauging understanding, but that targeted / random questions are more useful.

• Opportunities to practise and embed key skills and concepts.

• Lots of opportunities to practise skills during the lesson. The process is more important that the quantity of any written work.

• Use of representations, including “Part, part whole“ and bar modelling. See appendix

• Collaboration with other children and opportunities to explain their methods to a partner. We learn a little by just listening, more by actually doing and even more by explaining to somebody else. ***"Know it - now teach it!"***

• Opportunities to deepen learning by the provision of well-chosen activities which enable concepts to be explored in depth. Specific examples can be found on the Power Maths website, and the “I See Reasoning” documents.

• All lessons should contain an opportunity to practise quick, mental recall. Effective mental recall and fluency are pivotal in enabling children to access the maths curriculum as a whole, and is a tool required for tackling more complex ideas. This may consist of times tables, number bonds, counting on and back and other strategies such as bridging, compensating and partitioning. Further details can be found in the **calculation policy in the appendix**.

• There is an expectation that children will be asked to contribute to lessons, either by answering direct questions or sharing their ideas with others.

• Lessons will always contain an element of revisiting past work. This could be to consolidate recent work, or to embed key number skills which are needed to underpin other areas of the maths curriculum.

• It is also important that children do not "default" to using formal, written methods when a quicker and more efficient method is available. This has particularly come to light after the removal of the SAT's mental maths test as of 2016.

• If a lesson is not going according to plan because the children are not grasping the concept, the lesson will be adapted and if required, revisited. The needs of the learners is paramount.

• Staff will be aware of key misconceptions in advance, and their planning will take account of these. The Power Maths units and NCETM spines provide teachers with additional support with this.

• Key misconceptions will be addressed via whole-class mini-plenaries, or through targeted individual interventions. Early intervention is key.

• Using the system of red, amber and green, teachers will gain feedback from the pupils in terms of how they found the lesson. However, we always encourage pupils to seek assistance during the lesson if they are stuck rather tban waiting until the end of the lesson.

Early Morning Work

Additional maths practice will be used for the consolidation of key skills, or even to revisit concepts which need further work as a result of ongoing assessment.

Homework

This will be set weekly using a mixture of paper-based learning and IT based platforms such as Mathletics. All tasks set will be monitored and marked, either individually or as a class. As with all pieces of work, they will be used to inform planning or next steps. Maths homework can take the form of consolidation of key skills or provide opportunities to explore concepts further.

Assessment / reporting

Assessment takes place in all lessons on an informal level. This enables the teacher to decide where to intervene, who needs additional support or whether a "mini-plenary" is needed to provide additional whole class input. We believe in the idea that early intervention is key, as misconceptions / errors can quickly become embedded unless addressed.

At the end of each unit, the children will undertake the Power Maths end of unit assessment, which enables the teacher to gauge the level of understanding and to inform future lessons.

At the end of each term, the children will undertake the NFER assessments. This will be used not only by the teacher, but by the maths lead and senior leadership team for whole school data analysis. This data will also form a key part of the termly ***"Ensuring Good Progress"*** meetings, where discussions will take place on what needs to happen / change in order to ensure that all pupils are making effective progress, in relation to prior attainment and aspirational targets.

The data from the summer term NFER tests will also be used as key information for the next year.

Children in years two and six will undertake the primary national assessments (SAT's) for the end of key stage one and two respectively in accordance with national guidance.

Children in year four will undertake the multiplication tables screening test in June of each year. Mock assessments will take place throughout the year, monitored by school leaders.

In the autumn and spring terms, parent consultation meetings will be held at which targets will be set by teachers in order to support children to make progress and plug gaps in knowledge.

Teacher assessment data will be entered onto the school's system, ***Target Tracker***, at the end of each term. This will be moderated in conjunction with school leaders. For EYFS and year two, cross federation and cluster moderation will take place in order to validate judgments prior to being submitted for national data collection.

Impact

- Children will make good or better progress across all year groups. As cohorts, they will make better than average progress. At key stage one and two, we aspire for as many pupils as possible to be judged as "exceeding" national expectations.

- Children will be fluent with rapid recall of facts and procedures

- Children will have the flexibility and fluidity to move between different contexts and representations of mathematics.

- Children will have the ability to recognise relationships and make connections in mathematics.

- A mathematical concept or skill has been mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.

- Children will communicate their confidence in maths, and that they feel challenged and supported.

These will be assessed through: assessment, tracking, pupil progress meetings, performance management, moderation and pupil conferencing.

Resources

There are resources on the server to support with the teaching of maths. Below, there are also some useful weblinks providing resources and other CPD support.

Power Maths Primary	https://resources.whiterosemaths.com/resources/
Power Maths Diagnostic Questions.	https://diagnosticquestions.com/whiterose
Mathletics	www.mathletics.co.uk
NCETM ***LOADS of great resources to support with maths teaching***	https://www.ncetm.org.uk/
NCETM Spines	https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/primary-mastery-professional-development/
Joint Mathematical Council for the UK (JMC(	https://www.jmc.org.uk/
SOLO Taxonomy Explained	https://www.youtube.com/watch?v=uDXXV-mCLPg
I see Maths	https://www.iseemaths.com/#
Third Space Learning ***(Loads of great ideas and some free resources)***	https://thirdspacelearning.com/
Transum Maths ***Good for open-ended questions and extension***	https://www.transum.org/Software/
NRich ***great for extensions / open-ended challenge for the more able***	https://nrich.maths.org/
Classroom Secrets (premium site) ***Aligned with Power Maths, and***	https://classroomsecrets.co.uk/

	provides extra activities.	
	Maths4everyone ***A great resource bank***	https://www.maths4everyone.com/
	Timestables.co.uk ***A range of practice for times tables, including preparation for the year four screening test.***	https://www.timestables.co.uk/
	Twinkl Planit (Maths) ***Extra activities to support Power Maths.***	https://www.twinkl.co.uk/resources/planit-primary-teaching-resources/planit-maths-primary-teaching-resources
	Power Maths Diagnostic questions ***Good for informal class assessments / starters***	https://diagnosticquestions.com/whiterose
	Maths Salamanders ***A great resource bank - the mental maths activities are good for early morning work***	https://www.math-salamanders.com/
	Brain Bashers (Maths for the more able)	https://brainbashers.com/

Appendices

1. Rosenshine's principles of instruction
2. AFL - questions worth asking
3. Quality Questions for Thoughtful Answers
4. National Curriculum guidance for formal calculation methods.
5. Representations