Mathematics Policy

Vision Statement

Our School is built on the teachings of the Bible and inspired by The Gospel Values of Faith, Hope and Love.
Our Christian ethos is upheld by respecting humanity fostered through our community
that is welcoming, inclusive and forgiving.
Together we flourish through courageous learning, friendships and generosity.

Updated: April 2023

Agreed by The Learning & Development team of our Governing Body:

Review Date: April 2024

Mission Statement

Our hope is that each child at Deal Parochial Primary School will develop an appetite for learning that will endure throughout their lives. To achieve this, the curriculum will need to motivate and excite children so that they engage fully in learning, cultivate positive attitudes and relationships, make good progress and fulfil their true potential – being **"The best that I can be – the way God intends".**

Vision for teaching and learning in mathematics

At the centre of our approach to the teaching of mathematics, at Deal Parochial Church of England Primary School, is the unwavering belief that **all children have the potential to succeed**. We believe that **all children** need a **deep** understanding of the mathematics they are learning so that: future mathematical learning is built on solid foundations. We have a 'Growth Mindset' attitude to learning that develops a child's belief in themselves and their ability to succeed.

Purpose

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 Framework Mathematics Sept 2013)

At Deal Parochial we believe in the importance of developing mathematical skills in our children so that they are efficient and confident in their approach to mathematics in a wide range of contexts. A good knowledge and understanding of mathematics provides a way of viewing and making sense of the world. It is a very powerful means of communicating information and as such, plays an important part in all areas of the curriculum. We strive to deliver quality teaching of mathematics enabling pupils to reach their true potential.

Aims

The National Curriculum 2014 for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

At Deal Parochial School we believe that all pupils should be able to:

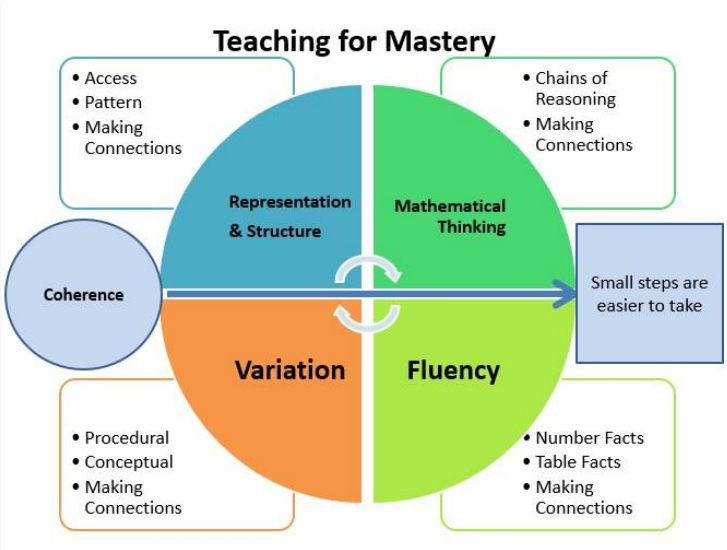
- use mathematical concepts, facts and procedures appropriately, flexibly and fluently;
- recall key number facts with speed and accuracy and use them to calculate and work out unknown facts;
- have sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems.
- solve problems of greater complexity (i.e. where the approach is not immediately obvious), demonstrating creativity and imagination;
- independently explore and investigate mathematical contexts and structures, communicate results clearly and systematically explain and generalise the mathematics.

Teaching at Deal Parochial is underpinned by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.

The '5 principles of mastery' model exemplifies our aims in relation to the teaching and learning of mathematics.

Our school has been part of a Maths TRG (Teacher Research Group) since 2018; evaluating the effect of teaching for mastery within Maths. This year (2022-2023), we continue to take part as a sustaining work group.

The mastery approach is defined by five key principles, as illustrated in the diagram:



Fluency:

- Quick recall of facts and procedures
- The flexibility and fluidity to move between different contexts and representations of mathematics.
- The ability to recognise relationships and make connections in mathematics

Representation & Structure:

- Mathematical structures are the key patterns and generalisations that underpin sets of numbers – they are the laws and relationships that we want children to spot. Using different representations can help children to 'see' these laws and relationships.

Variation:

- Procedural variation – This is a deliberate change in the type of examples used and questions set, to draw attention to certain features.
- Conceptual variation – When a concept is presented in different ways, to show what a concept is, in all of its different forms.

Mathematical thinking:

- Looking for pattern and relationships
- Logical Reasoning
- Making Connections

Coherence:

Teachers should develop detailed knowledge of the curriculum in order to break the mathematics down into small steps, to develop mastery and to address all aspects in a logical progression. This will ensure deep and sustainable learning for all pupils.

We aim as a school to:

- to improve children's using and applying of mathematical concepts in real life maths problems and developing their skills in using manipulatives;
- to provide an effective curriculum which gives teachers, pupils, employers and the wider community a clear and shared understanding of the skills and knowledge that children will gain at school;
- to ensure that the children enjoy Mathematics, are creative and confidentand appreciate what Mathematics is, what it involves and why it is important;
- to provide and develop good practices for all children, with the over-riding aim being to raise standards;
- to give pupils the opportunity to learn in ways that maximise the chances of success.

In order to support the children's learning from Year 1 to Year 6, we have invested in a subscription to White Rose Maths Premium Resources and colourful exercise books that help children to learn in small steps towards mastery. The exercise books show strategies in pictorial and abstract ways, encouraging them to work kinesthetically too; they help to develop children's knowledge and understanding using both conceptual and procedural variation. EYFS also use White Rose resources, but in a practical way.

Mastering Number:

In 2021, we successfully bid to take part in an NCETM pilot scheme called 'Mastering Number' – this programme is a local Maths Hub workgroup. Teachers from EYFS, year 1 and year 2 have regular online meetings with a member of the maths group; they all have access to daily short session planning to reinforce number skills.

This project aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.

Mathematics in the Early Years Foundation Stage:

The revised EYFS framework (Published 6th March 2021) has been fully implemented since September 2021.

The 7 early learning goals remain the same – with mathematics being one of the four specific areas – but changes have been made to the wording in the educational programmes. Specifically, this means:

- they are longer, there is more depth, and they contain examples of things that you can do with children
- there is a new focus on early language and extending vocabulary, with more examples on how to embed and develop vocabulary skills across all 7 areas, because this improves child development in a broad curriculum

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes

and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

ELG: Number

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, including double facts.

ELG: Numerical Patterns

Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system;

- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;

- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

This framework does not prescribe a particular teaching approach. Play is essential for children's development, building their confidence as they learn to explore, relate to others, set their own goals and solve problems. Children learn by leading their own play, and by taking part in play which is guided by adults. Practitioners need to decide what they want children in their setting to learn, and the most effective ways to teach it. Practitioners must stimulate children's interests, responding to each child's emerging needs and guiding their development through warm, positive interactions coupled with secure routines for play and learning. As children grow older and move into the reception year, there should be a greater focus on teaching the essential skills and knowledge in the specific areas of learning. This will help children to prepare for year 1.

At the beginning of the EYFS children will be assessed using The Reception Baseline Assessment (RBA) which is a short assessment, taken in the first six weeks in which a child starts reception.
At the end of EYFS each child's level of development must be assessed against the new early learning goals for mathematics **- Number** and **Numerical patterns**. Practitioners must indicate whether children are meeting expected levels of development, or if they are not yet reaching expected levels ('emerging'). This is the EYFS Profile.

KS1 & KS2

The Programmes of study for mathematics are set out year by year for Key Stages 1 and 2 in the National Curriculum (2014). The programmes of study are organised in a distinct sequence and structured into separate domains; following the 'White Rose Maths Hub Programme of Study' in Years 1, 2, 3, 4, 5 and 6. Teachers will also use additional resources to promote fluency, especially in number, and are permitted to come away from the White Rose programme, using their professional judgement and expertise, if they feel that certain ways of teaching units are not working for the children in their class. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

KS1

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools).
At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.
Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2
The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyze shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.
By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. They will take part in the DfE multiplication tables check (MTC) in June 2023.
Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2
The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
By the end of Year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
Pupils should read, spell and pronounce mathematical vocabulary correctly.

Teaching and Learning
The approach to the teaching of mathematics within Deal Parochial CEP School is based on: -
- A mathematics lesson every day
- A focus on fluency to ensure that pupils are confident with mental and written strategies – we use a range of teaching resources to support this, such as: Target your Maths textbooks from year 2 up to year 6; Twinkl age related activities; Nrich resources to extend and challenge those children who are working towards or at greater depth.
- A clear focus on direct, quality first, instructional whole class teaching and interactive oral work. We plan for a 'Mastery' curriculum, using the Kent and Medway 'White Rose' planning resources. Lessons take place daily, for all children, in mixed ability classes. Daily lessons regularly consist of a mental oral starter activity or a range of arithmetic questions, daily times table practice (KS2), direct teaching with a model to instruct; followed by an independent task and a plenary (review). Teachers will share the key vocabulary encouraging children to use and apply these in their work.

Homework
All year groups will give maths activities, based on current learning, and times tables practice as homework on a weekly basis to consolidate learning.

Planning
Planning is based upon the National Curriculum (2014). Programmes of Study should inform medium term plans and subsequently weekly planning. Class teachers are responsible for the relevant provision of their own classes and individually develop weekly plans which give details of learning objectives and appropriate differentiated activities. Although planned in advance they are adjusted on a daily basis to better suit the arising needs of a class and individual pupils.

The learning intentions and success criteria for each lesson are shared with pupils. Lessons should include mental starter activities which enable all pupils to participate and demonstrate their understanding. These include activities linked to the 'Big Maths' scheme of work, Tough Ten, Fluent in

5, Flashback 4, and Testbase questions (from past SATs questions). Teachers ensure that there are adequate resources, including manipulatives, to support children's learning. Teachers plan in advance how they and the Teaching Assistants will work with children of mixed abilities. Assessment outcomes are included in the success criteria part of the plan.

Cross curricular links
Throughout the whole curriculum, opportunities to extend and promote Mathematics should be sought. Nevertheless, the prime focus should be on ensuring mathematical progress delivered discretely or otherwise. In addition to a daily numeracy session, we aim to apply the key skills outlined above throughout the curriculum in the area of Enterprise. Wherever possible, links are made to real- life situations or to other curriculum areas and the purpose of why we are learning a concept is made clear to children. Teachers seek to take advantage of all these opportunities within our topic-based curriculum.

Differentiation
All of our staff have high expectations of all children, irrespective of ability, and encourage them to be successful and achieve their full potential. Our aim is to ensure challenge for all. Children are encouraged to have a growth mindset about their ability to do mathematics. Encouraging children to 'have a go' is seen as paramount. We aim to develop the mantra that: 'I can't do it yet' rather than 'I can't do it!'

In some lessons, children 'self-differentiate' and choose the level of challenge right for them. In other lessons, teachers direct children to the correct level of challenge based on their assessment in the initial phases of the lesson.
At the beginning of each maths lesson, all children are taught together – they are then supported and/or challenged in their independent work by being given a range of activities that all focus on the same learning intention but enable more able children to work at a greater depth.

The differentiation of tasks is delivered in various ways:
• Open ended questioning and activities which allow more able children to offer more sophisticated mathematical responses.
• Stepped Activities which can be accessed at different steps, supporting and challenging all.
• Recording e.g. allowing some children to give verbal responses and photographing their learning.
• Resourcing e.g. Use of cubes, 100 squares, number lines, mirrors to support some children.

Activities are based on the same theme.
Part of independent work often involves some focused, targeted group work from the teacher. However, groupings are 'fluid and flexible' based on the children's performance in a previous lesson or the beginning of that particular lesson.
We use teaching assistants to support and challenge groups of children; they use the same teaching methods modelled by the teacher to support individuals or groups.
The adaptation of the curriculum tailored to meet specific individual needs.
The use of specific programs and strategies that have been recommended by the SENCO or external agencies, including the use of ICT.

Interventions

If a pupil fails to grasp a concept or procedure, this is identified quickly, and early intervention ensures the pupil is ready to move forward with the whole class in the next lesson. Where possible, same day intervention is the most effective.
After school sessions are delivered with selected children from years 5 and 6, once a week, working with their own classroom TA. The children involved are then swapped with others, according to their needs, as they become more confident and are more able to access whole class teaching and learning.
Provision maps/Data reflection should identify which children are receiving additional intervention; PP & SEN children; also, children who are not progressing as they should be. Boxall Profiles are set up for all children across the school – these also help to identify pupils who need additional provision.

Assessment
By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.
Early Years outcomes and learning objectives from the National Curriculum are highlighted based on a child:

'Working Towards', 'Mostly Achieved', 'Achieved' and 'Working at Greater Depth'

Short term
Teachers, in the course of their daily practice, will carry out informal assessment and evaluation of the planned teaching programme. Teachers will use:

Statutory framework for the Early Years Foundation Stage - Setting the standards for learning, development and care for children from birth to five

- Best fit judgements about children in the Reception class using the 'Development Matters in the EYFS' Guidance
- Assessment for Learning techniques;
- Self-assessment against learning intentions and success criteria in plenary;
- Teacher assessment through questioning and observation;
- Talk partners and small group discussions in the context of the task set;
- Individual discussion where the children are encouraged to appraise their own work and progress;
- White Rose fluency, reasoning and problem-solving questions – nationally moderated tasks which give an 'expected' age related level of ability.
- Cold and hot tests, using White Rose unit assessment resources before and after the unit has been taught to provide teachers with an insight into what the children already know and how they have progressed by the end of the unit they are working on.

Medium term
Children may be assessed using an 'end of season test' i.e. Autumn, Spring and Summer (White Rose assessments). Gap analysis should be carried out by the class teacher to determine which concepts are fully understood and which concepts are not fully embedded and by whom. Teachers should plan to revisit these concepts. Sonar is used to record data in all year groups from the Early Years up to Year 6, which is collected three times a year, in Terms 2, 4 and 6.

Long term
Formative assessment is carried out through various stages of primary school:
- Teacher Assessments using pupils' tasks which are moderated by colleagues.
- Children at the end of the Reception year are assessed against the Early Years Foundation Profile.
- SATS in Year 2 and 6;
- School based assessment takes place in Y1;
- Optional QCA Tests in Y3, Y4 and Y5.

Marking
Oral and written feedback should inform children about their progress in Mathematics.
Effective marking should:
- be linked to the Learning Intention;
- be encouraging and supportive (√);
- be marked as the task is being carried out (live marking) with verbal feedback;
- self-marking as the teacher goes through the questions and answers.

Working walls
All classrooms have clear working walls where unit objectives, models, vocabulary and visual images used in previous and current lessons are displayed and referred to. Children use these to support their learning.

Equal Opportunities and Special Needs
Our Mathematics curriculum aims to ensure that it:
- reflects the interests and achievement of both boys and girls;
- encourages everyone to see themselves as successful mathematicians;
- provides pupils with equal access to equipment;
- includes varied groupings and activities to support children with SEN and those who are able learners;

- values and supports the cultural and linguistic background of all our children;
- gives all children the opportunity to achieve their full potential irrespective of race, gender, physical disability, ability or class;
- has high expectations of all pupils.

(See Equal Opportunity Policy)

Recording

The National Primary Framework for Numeracy lays out the progression for calculations across the Key Stages. These can be found in the school's 'White Rose' Calculation Policy.
Children are encouraged to record their work using a range of mental, informal and formal methods. Pupils should be encouraged to write one number in each square. Children should be taught to work and record systematically.

Monitoring and Evaluation

The mathematics subject leader is given opportunities to work alongside other teachers. This time is used to monitor and evaluate the quality and standards of mathematics throughout the school and enables the subject leader to support teachers in their own classrooms.
This may be done through:

• Lesson observations
• Checking of marking and progression in children's books
• Checking of planning and lesson resourcing
• Pupil voice
• Liaising with teaching staff and offering guidance on planning and supporting the children in their learning

Role of the Subject Leader

• To take the lead in policy development
• To support colleagues e.g. leading staff meetings for CPD, planning support, team teaching
• To monitor and be accountable for progress in Mathematics – this may be done through scrutiny of work, observations and analysis of formal assessment data
• To take responsibility for the choice, purchase and organisation of central resources for Mathematics, in consultation with colleagues
• To liaise with other members of staff to form a coherent and progressive scheme of work which ensures both experience of, and capability in, Mathematics
• To be familiar with current thinking concerning the teaching of Mathematics, and to disseminate information to colleagues
• The subject leader will report on mathematics to the Head teacher and will liaise with the named link governor, who will perform monitoring alongside the subject leader.

Sarah Warner. Mathematics lead teacher.

MATHSHUBS KENT AND MEDWAY | Kent & Medway Maths Hub Partner School 21/22