DODDISCOMBSLEIGH PRIMARY SCHOOL

MATHS

How do we develop Mathematicians at Doddiscombsleigh Primary School?

INTENT

As a Rights Respecting school, children's rights from the United Nations Convention on the Rights of the Child (UNCRC) underpin our curriculum intent in all subject areas. Article 29 states that: Every child has the right to an education.

Education must develop every child's personality, talents and abilities to the full. It must encourage the child's respect for human rights as well as respect for their parents, their own and other cultures, and the environment. (UNCRC)

At Doddiscombsleigh Primary School, our intent is to promote an enjoyment of mathematics in a variety of different ways, including: through practical opportunities to explore mathematical concepts, as well as through exploration and discussion. This helps the children to become fluent in the fundamentals of mathematics from an early age. Our aim is to develop pupils' mathematical fluency and confidence, to enable them to solve a range of problems and articulate answers in a concise and logical manner, across the curriculum and in everyday life. Each mathematics lesson will challenge every child, regardless of their ability.

We encourage the children to be active participants in maths lessons, in which they work both collaboratively and independently. We believe in creating an environment where children feel comfortable to share their thinking, question one another, to agree or disagree, and justifying their decisions. Calculations and concepts are represented in different ways moving from concrete representations where children can build their understanding using equipment and manipulatives, to visual representations, before moving on to abstract representations.

Our aim is for pupils at Doddiscombsleigh Primary School to display positive attitudes towards mathematics and embrace mathematical challenges, to not shy away from failure, making mistakes and taking risks. We provide pupils with opportunities to develop their mathematical fluency, building their confidence to carry out a range of problems and solve them by utilising their reasoning and problem-solving skills. As a school we are committed to ensuring that children are able to recognise the importance of mathematics in the wider world and that they are also able to use their mathematical skills and knowledge confidently in their lives in a range of different contexts. This also extends to how mathematics can be used within other areas of curriculum through rich cross-curricular links.

Relentless efforts are taken to improve, push and challenge the outcomes for all children, achieving and fulfilling their potential whilst reaching the intentions of the National Curriculum. Staff are aware that depth of knowledge underpins all skills.

Staff have the highest expectations in the teaching of Mathematics and our aims are:

- To promote the enjoyment of mathematics by learning through practical, investigative and hands on experiences using a range of manipulatives.
- To raise attainment of pupils working at greater depth.
- To become fluent in the fundamentals of mathematics and are able to instantly recall number facts.
- To build on knowledge gained from Reception to Year 6

IMPLEMENTATION

At Doddiscombsleigh Primary School, we follow the National Curriculum and use the mixed-year planning and resources from White Rose Maths to support the delivery of mathematics throughout the whole school. Within each of the maths learning sequences our children will experience:

- Real life problem solving and investigation.
- Taking risks and learning from mistakes.
- Active and engaging learning.
- Opportunities to prove and explain ideas.

- Personalised learning and activities that provide challenge.
- Opportunities to build resilience and encouragement to self-challenge in their learning.
- Deep levels of questioning and reasoning.
- Cross-curricular application - making links with other areas of learning.
- Developing skills, which can be transferred and applied in different contexts.
- Peer support through discussion.

Throughout the school we use a mastery approach to help develop a strong foundation for all children to achieve their potential.

What is mastery in maths?

Mastery is the ability to select and apply appropriate strategies, giving justification, when solving problems in an unfamiliar context. A mastery approach demands that pupils use prior learning to make or build deeper connections in new contexts, in preparation for future learning opportunities.

"In mathematics, you know you have mastered something when you can apply it to a totally new problem in an unfamiliar situation…" (Dr. Helen Drury, Director or Mathematics Mastery.)

At Doddiscombsleigh Primary School, we support this by creating opportunities for pupils to practice, illustrate, handle and explain mathematical problems in each sequence we teach. This involves the use of a wide range of mathematical representations and resources.

What does mastery in mathematics look like at Doddiscombsleigh Primary School?

Teaching is underpinned by knowledge of developmental progressions. All year groups follow the White Rose Mastery Framework to ensure a consistent learning approach towards mastery runs throughout the school, to ensure a smooth transition between each sequence, a coherent journey and consistent challenge for our children.

Teachers are expected to use their professional judgement when following this scheme. This may involve spending more time on a given area than suggested on the planning, or choosing an alternative representation to teach a concept. Concepts are taught in depth, with adequate time spent on each area before moving on. Our skills progression document created from the National Curriculum, inform teachers of the expectations of each year group.

At Doddiscombsleigh Primary School, we utilise the NCETM's Five Big Ideas to underpin our teaching for mastery which includes Fluency, Coherence, Representation and Structure, Mathematical Thinking and Variation. This ensures lessons are connected and small steps are taken. Teachers are confident in pedagogical subject knowledge in all strands of mathematical learning.

Additionally, to gain a mastery understanding in each sequence, we focus on three main areas: fluency, problem solving, and reasoning. These areas will be evident throughout each teaching sequence, in the following ways:

Fluency: We incorporate fluency practice, both within each maths lesson, as well as throughout the day by using Numbots and Time Table Rock Stars.
Problem Solving: Children are given opportunities to solve **practical, illustrated** or **abstract** problems throughout each sequence.
Reasoning: Reasoning forms a key part of every mathematics session. Each class participates in a 'Maths Talk' and 'Flash Back' at different points within a lesson. This gives pupils a chance to discuss the patterns and links to previous learning, and to understand other pupils' interpretations.

All children are encouraged to be active participants in mathematics lessons and discussions, their opinions valued and feel comfortable to share ideas, even if they are uncertain. Children are encouraged to question each other; agree and disagree, justifying their reasoning politely e.g. 'I kindly disagree because…' and use 'stem' sentences in their learning. These are displayed in classrooms for children to use daily. This is to support the children's language development and to allow all pupils a mode to express their own understanding.

Staff are developing their use of Blooms Taxonomy within their questioning to target higher level order thinking and challenge children's understanding.

Learning is differentiated through the use of our Progress Pathways to ensure appropriate levels of challenge and ensures high expectations of all children, including those with Special Educational Needs (SEN) and those from disadvantaged

backgrounds, as well as those working at a greater depth level. Assessments inform planning and identify those who require targeted interventions or pre-teaching. Interventions are also used for children on track to be greater depth mathematicians, not just those who find Maths a tricky subject.

Mathematics within the classroom environment

All classrooms within the school place high value on mathematics. Every classroom has a learning wall dedicated to mathematics; these display items to support, develop and challenge pupils within the sequence of learning. They are designed to act as aide memoire for children, an additional teacher, that the children access independently. These learning displays mirror the key parts of a lesson structure: flashbacks to prior learning that may support them as they move through the sequence, key vocabulary, a variety of representations of concepts being explored, stem sentences and key questions to promote deeper thinking. Children are also encouraged to be resourceful and have access to a wide range of resources and supportive materials and equipment, which promotes independent learning.

A snapshot of how we teach Maths in our Reception/Key Stage One Class:

- All lessons have a 'Can I …' learning objective as a starting point. These are taken from the WhiteRose blocks against the Long Term Plan, an example of which can be found on our school website, which shows its coherent structure.
- The teacher will warm up the class with a short activity as a form of retrieval practice which Reception will join in for. After this, Reception will continue their input with the TA for a short 15 minute input before accessing their continuous provision (reception receive a guided session with their teacher once a week and guided sessions with a TA 4x a week).
- Where possible, Reception will carry out their Maths in an active, outdoor fashion, whether it's counting and sowing seeds, comparing sizes of sticks or creating mud shapes.
- With Year 1 and 2 during the input, the teacher may model, show a representation or explore a concept, choosing accurate and differentiated questions to various children dependent on their ability. During this time, children will have the time to discuss with peers, critique others' answers and ask questions.
- Following the input, Year 1 and 2 children will carry out activities/investigations either written in their books using manipulatives or through hands on activities without the need to evidence in books (if it does not lend itself to this).
- Whilst we use WhiteRose as a mastery curriculum, to accurately pinpoint and challenge the higher attaining children, an additional resource is used called Classroom Secrets which identifies specific standalone Greater Depth questions against the WhiteRose individual objectives.
- Due to our small class size and the layout of the desks, the teacher is able to support a child or observe their workings, providing instant feedback and guiding or deepening learning.
- The importance of investigations and real life problem solving tasks is valued and NRICH resources are used once a week.

A snapshot of how we teach Maths in our Mixed Key Stage Two Classroom:

- All lessons start with a 'Can I …' learning objective as a starting point. These are taken from the White Rose blocks against the Long Term Plan.-an example of which can be found here which shows its coherent structure. The teacher will sometimes warm up the class with a short activity- for example Multiplicity Image of The Week. After this, the Class will split into 2 groups:
  A Year 3 and Year 4 group
  A Year 5 and Year 6 group.
- Each group will be provided with a direct teaching input, delivered by either the class teacher or TA to introduce the subject of the lesson. During this time, the teacher may model, show a representation or explore a concept, choosing accurate and differentiated questions to various children dependent on their ability. The teacher and TA will alternate the group that they work with each day to ensure a fair and consistent amount of time is spent with each group. As part of the direct teaching input, children will have the time to discuss with peers, critique others' answers and ask questions.
- Following the input, children across all year groups will carry out differentiated activities/investigations, often using manipulatives. Whilst we use White Rose as a mastery curriculum, to accurately pinpoint and challenge the higher attaining children, an additional resource used is 'Classroom Secrets' which identifies specific standalone Greater Depth questions against the White Rose individual objectives.
- Due to our small class size, the teacher is able to support a child, observing their workings, providing instant feedback and guiding or deepening learning. Children are empowered to own their learning through a planned problem solving approach and investigative tasks carried out fortnightly. (This enables the teacher to access UKS2 and LKS2 groups in consecutive weeks).
- For each different block within White Rose, we follow the same Maths journey starting with an elicitation task to inform the sequence of the learning. The end point of the block is a completion of the same elicitation task (which becomes our end of block task) to evaluate progress and highlight areas for development. At the start of

a block, after the elicitation task, a target is identified and set for each child. The learning sequence that follows will include a lesson that focuses on every child's target.

IMPACT

The impact of our mathematics curriculum is measured through careful monitoring of pupil progress and attainment throughout each school year, and for every year group.

Progression of children's mathematics is constantly monitored through the following ways:

- Each sequence of learning begins with an elicitation task that enables staff to tailor teaching and learning sequences to suit the needs of the group of children, as well as identify targets. These elicitation tasks have been particularly useful in enabling identification of key learning gaps which have resulted from lockdown periods due to Covid-19 restrictions.
- Application tasks at the end of a sequence of learning also enables teachers to monitor small steps progress within a particular area of mathematics. In addition, more formal termly assessments help to inform overall assessment judgements.
- Verbal discussions with children
- Formative assessment in daily lessons,
- Termly assessment,
- Teacher judgements

At Doddiscombsleigh Primary School, ongoing Assessment for Learning (AfL) throughout the learning sequences, allows for flexibility in use of groupings. Our Progress Pathways ensures high quality differentiation and challenge within age-related expectations, whilst also enabling the children to independently challenge themselves based on confidence levels. We use a clear marking policy throughout the school to give accurate, concise and clear feedback to our pupils. Verbal feedback is encouraged during the lesson as is peer marking. Children respond to teacher marking in green pen.

The impact of the mathematics curriculum is further monitored by our subject leaders through the use of monitoring practices, such as pupil conferencing and book scrutiny. The findings from monitoring help to inform subject action plans in order to ensure a strong model of subject development based on current research and pedagogy.

We want the impact of the children's learning and progress to demonstrate that:

- Children can talk with confidence about what they have learned, using correct terminology.
- Children are enthused and interested in in a wide range of mathematical areas.
- Children can show adults examples of their learning and describe the 'why' behind answers they have provided.
- Children are able to explain how their learning within a specific block builds on previous learning.